WHEAT—
THE RIDDLE OF MARKETS

A Brief Study of the Production, Sale and Consumption of Wheat

BY
CHAS. W. PETERSON
Author of "Wake Up Canada", "The Fruits of the Earth," etc.

CALGARY, CANADA
"FARM AND RANCH REVIEW-LIMITED"
1930

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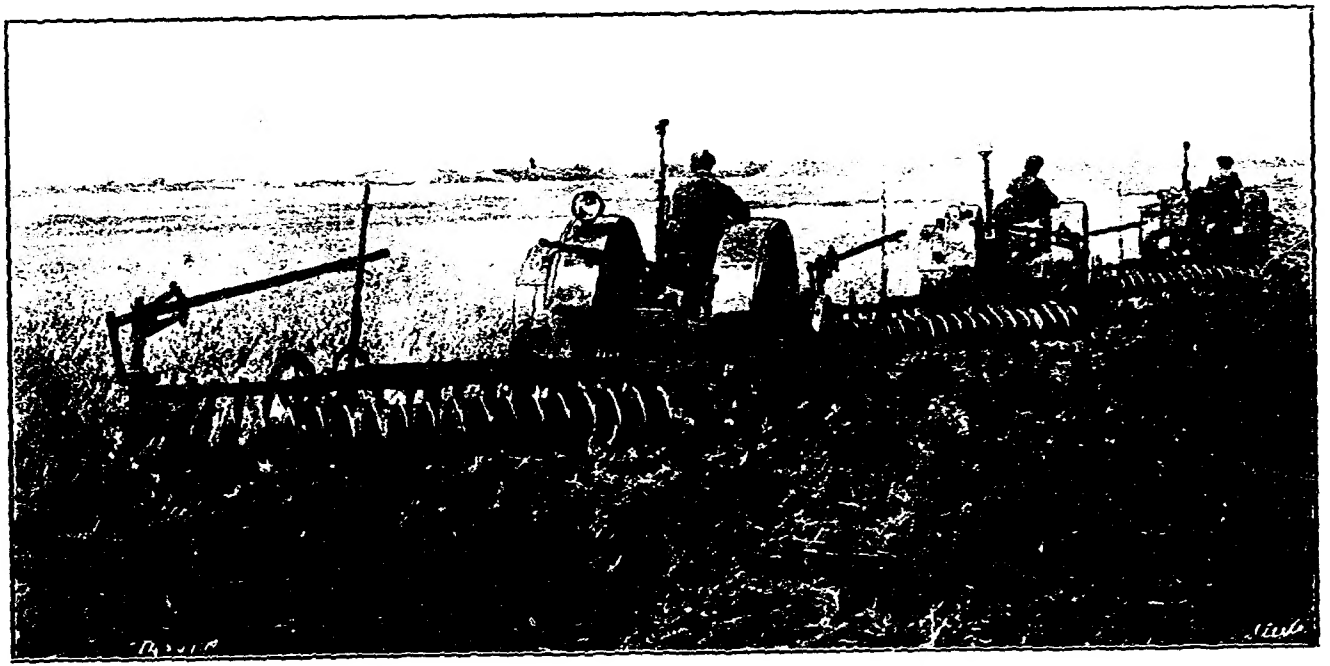

ONE HUNDRED AND SIXTY ACRES EVERY DAY.—That is the story told by these McCormick-Deering 15-30 tractors and harrow plows. They are used by the Wilson Brothers, of Harris, Saskatchewan, who farm nine sections of land near Saskatoon. Each tractor is equipped with electric lights, both front and rear, and two shifts of drivers operate twenty-four hours a day. Big-scale farm operations, such as this demand big capacity machinery in order to enable every man to produce a maximum day's work. The harrow plow is new to Western Canada, but has found immediate favor with those men who do not wish to plow deep every year and who do not want to stubble-in.

To
Rt. Hon. W. L. Mackenzie
King P.C.
with
Authors Compliments

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PREFACE

The great, unsolved problem that confronts the wheat grower the world over is whether the production of wheat will presently outstrip consumptive demand. It is a question of the most vital interest to Canadians of all classes, because the sale of wheat represents a sufficient percentage of Canada's income to affect national prosperity in a very profound degree. No one will contradict the bald statement, that no matter how extensive, important and flourishing Canadian industry may be, if the purchasing power of western agriculture should be very seriously impaired during an era of unremunerative wheat prices or low yields, a state of depression would descend upon the whole country, the consequences of which could hardly be estimated. I, therefore, know of no single economic issue of greater significance, from a national point of view, than precisely the questions of where the "breaking point" normally is in the wheat market, whether Canada is potentially able to create and pass this point in wheat production, and, if so, what the economic resultant would be to the prairie farmer, and, indirectly, to Canadian industry, commerce and transportation.

The monthly letters of our chartered banks for the past year disclose abundant and significant information in respect to the bearing the Canadian wheat crop has on transportation and general business conditions. It would be well for all Canadians to inform themselves on this subject, so as to reach a proper appreciation of the great role this product

plays in our national, economic life. The conclusion the intelligent student must inevitably come to is, that national prosperity depends to a vastly greater extent on the size and quality of the western wheat crop and its realizable value, than on any other single factor in commerce or industry. It is no exaggeration to assert, that wheat is the barometer of our economic life in Canada. Prosperity or adversity follow its course up or down. Every business executive should know and comprehend the facts of wheat and their relation to the general agriculture of the country. They are second in importance only to the problems surrounding his own business activities and are generally closely interwoven with them.

The history of the years 1928-29 is instructive. Up to 1928 the price level of wheat had been fairly satisfactory. That year, however, witnessed a huge world over-production, resulting in an abnormally large carry-over of wheat into the following year. Prices, however, still remained reasonably strong, a fact which is of great significance to the student of this problem. During the early part of 1929 there was, again, every indication of a great crop in Canada, with normal conditions elsewhere. As soon as this prospective situation became fairly assured, prices began to tumble under the strain of further over-production, culminating in a low record early in May of 1929, when wheat came dangerously close to the dollar mark on the Winnipeg market. Shortly after this spectacular break in the market, dry weather set in, and it soon became evident that the Canadian crop was going to be short. Prices promptly soared to unexpected heights and presently two-dollar wheat was freely predicted.

Then developed what was perhaps the most spectacular situation in latter day wheat marketing history. Prices again declined seriously, and the Wheat Pool promptly declined to sell. Wheat backed up, the transportation situation became demoralized and market stagnation was soon reflected in adverse general business conditions throughout Canada. A titanic battle developed between the producer and the buyer, which, at the time of writing, is still undetermined. The final outcome of this economic struggle will not be known for some time, but it will be epoch making, no matter how it ends. All this illustrates clearly the present commanding position of Canada in the world's wheat market. It also points to several morals.

During the early part of May, 1929, when wheat was at its lowest point, an executive of one of the largest advertising agencies in Canada asked me: "What will be the effect of dollar wheat on farm purchasing power?" He suggested that this question was then uppermost in the minds of the leaders in Canadian industry, commerce and transportation. Dollar wheat has, in the meanwhile, vanished from the economic horizon, but the state of mind that viewed with apprehension the economic consequences of dollar wheat, then, will, of course, be equally apprehensive of any such possible apparent catastrophe in the future.

The knowledge gained through a somewhat close study of the western wheat situation over a lengthy period and a forty-year wheat-producing experience in various sections of the west—in early days on a small scale, but in more recent years with production frequently exceeding the hundred-thousand-bushel mark in a season, and under varying marketing conditions,

ranging all the way from 40c. to $3.00 per bushel—suggests to me that an intelligent reply to my friend's question involves a consideration of at least the "high spots" of wheat economics, both from a domestic and world point of view, with special reference to the permanency, or otherwise, of wheat production in our west. I have endeavoured to cover this field of inquiry, as briefly as possible, in the following pages in the hope that it may present to the business men of Canada an intelligent, and not too technical, picture of the status, present and future, of Canada's main business, which undoubtedly it now is and will, in all probability, so remain for generations to come.

THE AUTHOR.

Calgary, Alberta, January, 1930.

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WHEAT-
THE RIDDLE OF MARKETS

CHAPTER ONE

HISTORY OF WORLD WHEAT PRICES

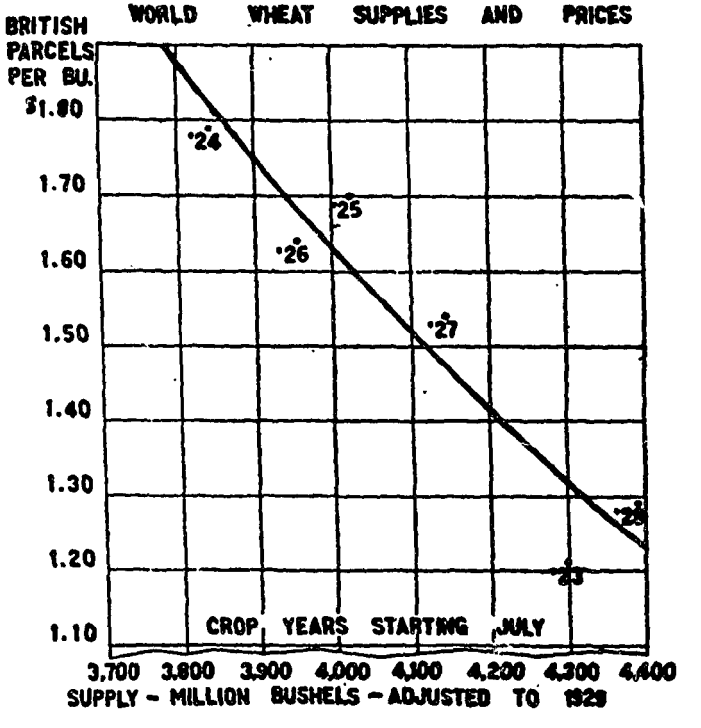
The history of wheat prices over centuries is a fascinating study. The facts revealed are quite contrary to popular belief. It covers to all practical purposes the agricultural history of the world, and throws a strong light on the probable future trend of wheat prices, and, incidentally, on prices of most other agricultural products, which move up and down largely influenced by the market price of wheat, the world's great, staple food stuff.

The truth about wheat prices is, of course, that however crude and ruthless the directive agency of the law of supply and demand may be, it has at least the merit of balancing scientifically the volume of supply with the volume of demand, through the fluctuations of the price basis. Within certain limits then, the normal, established price over a period determines volume. But volume absolutely determines price in any year. The 1923 Canadian wheat crop of 474,-199,000 bushels sold for $316,994,000, and the crop of 1924 of 262,097,000 bushels sold for $320,362,000. In 1924 wheat growers produced 212,102,000 bushels less than they produced the previous year, but they received about three and one-half million dollars more for the crop. Such a paradoxical market situation is apt to prove disappointing and bewildering.

No one has yet been able to fix the fair, normal market value of a bushel of wheat. We can only determine its intrinsic value compared with other

food stuffs. The cost of production per bushel has little direct bearing on the price in any one year. The climatic elements are always the largest factor in the cost. It may, however, safely be asserted, that from a point of view of cost per food unit, wheat is perhaps the cheapest of human foods, even in seasons of high prices. This is a fact of great significance, and will some day exercise its influence on wheat prices.

An attempt has been made by the "Farmer," of St. Paul, Minn., to construct a chart, based on world supply and Liverpool prices for the past six years, which would indicate approximately the relations between supply and market value of wheat, which I reproduce below:



In this chart, the year runs from July to July. The heavy line indicates the approximate average relationship between supply (outside of Russia and China) and price. Obviously, this chart, though interesting, cannot be regarded as anything but a crude indication of price and supply relationship, which is far from static, being influenced by tariff obstruction, purchasing value of money and other economic factors varying periodically. According to this chart the base value of the 1929 wheat crop estimated at 3,950 million bushels, should be about $1.68 per bushel, making proper allowance for the estimated, annual world increase in consumption of 60 million bushels.

The nearest we can come to estimating what may be considered a fair price for a bushel of wheat is to ascertain at what price farmers the world over are prepared to produce wheat in adequate volume, and at what point the task of growing wheat becomes unpopular, resulting in decreased volume followed by higher market bids. These figures would, of course, fluctuate from decade to decade in sympathy with the price of land, cost of labour and favourable or unfavourable seasons, so it will be quite clear that the past is the only fairly reliable guide to the future in this involved field of inquiry.

2

There is fortunately available, trustworthy records of wheat prices over six centuries in the Liverpool market, which afford a sound, historical background for conclusions on this subject. The following are the

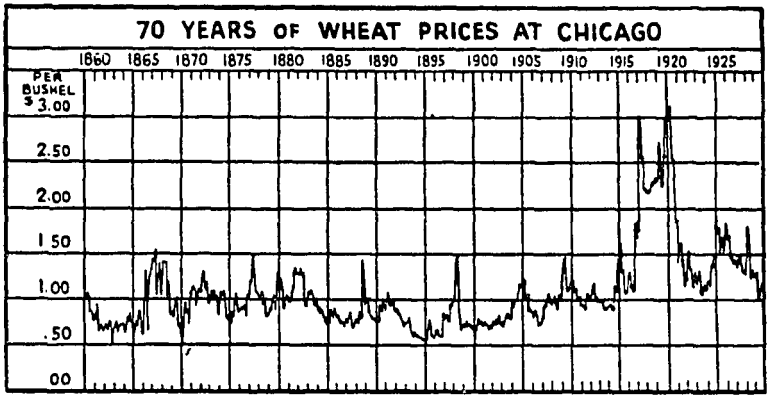
average wheat prices in Liverpool, reduced to Canadian currency, for three centuries:

1600–1699	$1.17 per bushel
1700–1799	$1.20 per bushel
1800–1899	$1.73 per bushel
1885–1913 Depression Period	.91 per bushel
1914–1920 War Inflation Period	$2.03 per bushel
1921–1926	$1.65 per bushel

On the face of it, this record shows a normal increase in wheat prices from century to century in terms of currency. Actually, it indicates an enormous decrease in the purchasing power per bushel, when it is considered that skilled labour during almost the entire three centuries was available at a shilling a day, and that labour cost represents eighty-five per cent. of the general selling prices of all commodities and services the wheat producer is forced to buy. During the second period, a bushel of wheat purchased five days' labour. To-day, it purchases less than a quarter of a day of skilled labour, meaning that wheat to-day has shrunk twenty-fold in purchasing power.

The generation now nearing extinction, viz., that which had attained manhood in 1885, has perhaps witnessed the lowest ebb of general agricultural values in recorded history. The fluctuation of wheat prices since the year 1800 is interesting. The average price of wheat for the year 1802 at Liverpool was $3.63 per bushel. In only two years did the average price fall below $2.00 a bushel until 1822. It remained at $1.50 per bushel and over, very frequently over $2.00, until 1875, with a few exceptions. It then descended gradually, but did not reach the one-dollar mark until 1885. Then came the collapse of prices until the low mark of 69 cents per bushel was reached in 1894. History

records only four years with lower average prices during the past 244 years, namely, 1706, 1732, 1743 and 1744. During those four years, average prices ranged from 63c. to 68c. per bushel. In January, 1895, wheat sold on the Chicago market at 49 cents. To produce a record of low, average wheat prices to come anywhere near comparing with those prevailing between 1886 and 1913, we have to go back in history prior to 1595! Taking into account that wheat prices may, over lengthy periods, be regarded as the index of all agricultural prices and the further fact, that the purchasing power of the dollar during that disastrous 27-year period, compared with more ancient times, was twenty times less, it is not difficult to conclude that that period easily represents the most calamitous chapter in agricultural history in centuries. The important point to consider now is, whether history in this case is apt to repeat itself.



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To this question I am able to reply with an emphatic No. This particular page of world economic history will not and cannot repeat itself. The cause

of this extraordinary price demoralization is absolutely clear and this cause has now been removed for all time to come. History and statistics show that it took the world the better part of half a million years to reach a population of 750 millions up to the year 1800. Food had normally been scarce and this near-starvation condition had acted as a powerful brake on natural increase according to well-known, economic laws. Came the golden age of invention, followed by rapid and cheap transportation on sea and land, which, in turn, led to the colonization, in temperate zones overseas, of vast continents of virgin lands, constituting huge food reservoirs. Between 1850 and the end of the century, the rich agricultural stretches of the middle western United States, Western Canada, Australia, New Zealand and South Africa were opened up and colonized. Millions of acres of virgin, arable lands, given away to the first comer who would agree to fulfill settlement conditions, were added to the world's food reservoir almost over night.

To add to the congestion, mechanization of agriculture made enormous strides, permitting of large scale operations with small labour cost. This historic movement probably reached its crest between 1875 and 1890. Cheap and abundant food automatically begot the most spectacular increase in world population that history records and probably ever will record. Within one brief century, during the latter part of which the world wallowed in food at bargain prices, population actually doubled reaching 1,500 million in the year 1900. A new era is, however, now dawning inasmuch as there are no more extensive empty spaces within temperate zones. The day of cheap food is definitely past, and presently the earth

will only be made to yield more abundantly through the expensive and laborious process of intensive cultivation. We may, therefore, safely conclude that there is not the least chance of this disastrous chapter in agricultural history repeating itself, and that, under present conditions, dollar wheat, in the absence of a substantial fall in the general price level, has become a very remote possibility, and then only as a temporary state brought about by a series of great world crops, which history shows will rarely occur.

CHAPTER TWO

FUTURE TREND OF WHEAT PRICES

But conditions may change. In fact, they are now in the process of change. With lower production costs, dollar wheat might conceivably reappear. But there is this safety factor to be considered, that the price of wheat will always leave a satisfactory margin of profit to the grower over any period, otherwise wheat simply will not be produced. The largest volume of settlement in history came to our prairies during the early part of this century precisely as a result of dollar wheat, which at that time was a profitable business. Wheat is, and always has been, one of the cheapest human foods available. It probably always will be. Canada will still be producing wheat for export when other nations may have been forced out of competition. And Canadian farmers will not raise wheat at a loss, over any period, whatever the price basis may be. There will be no occasion for any such sacrifice.

I have ceased to worry about the effect of increased Canadian production upon world wheat prices. The mental process which brought me to this decision is as follow: Canada now produces about one-tenth of the world's wheat in a fair year. The world (including Soviet Russia and China) now needs a minimum of five billion bushels per annum to feed itself. A small store is always on hand to guard against emergency, but this wheat is being harvested and sold almost every day of the calendar year. It starts in South America in January, Egypt and India in February and March, Persia, Asia Minor and Mexico in April, the Southern States and Asia in May, and then

comes the European crop and the Northern Hemisphere, ending up in November and December with South Africa, Burmah and the Argentine. I tried to visualize the whole marketing machinery and how the "wheels turn around," and I found myself up against the eternal question: Who fixes the price of wheat? That question must be answered before we know where we are at. Some people have an idea that a small group of men sit in a back room in Liverpool or Chicago or somewhere else and quietly agree on the market for the day. That the whole thing is merely a network of manipulation, skull-duggery and wild speculation.

2

There can be no doubt, that there is considerable manipulation of all sorts. It is not necessarily illegitimate. It is simply a matter of skilful bargaining and frequently of "nerves." It is my belief, however, that the larger issue of world prices are not influenced in any such manner, but are largely dictated by supply and demand. We will say, that the September price nets the western farmer a fair return, and wheat begins to flow freely. But over-sea's buyers hear that we have an enormous crop for export in Canada on top of a good European crop. They see visions of wheat falling in price after they have purchased thus placing their mills at a disadvantage in the flour market. They withdraw. Lack of buying orders depress the price a little. Still no orders forthcoming, and the wheat in a never ending stream pouring into the local markets. Prices, thereupon, tumble to a considerable extent, and the millers, now deeming their position safe, place buying orders. But prices have

now been depressed to the point where perhaps they do not cover the cost of production. What happens? The European grower stops supplies. He will not sell wheat at bargain prices. He doesn't have to. He can use his wheat more profitably for feed, or he will carry it over. He is individually a small producer. Collectively, the European grower raises quite often a full one-half of the world's crop, and he is therefore, at present the most important, in fact, the decisive factor in the situation. So prices go up again until he is tempted to market his product.

If this is the way it works, our ultimate bottom price would evidently be somewhere near what the European farmer will sell at, less our cost of transportation. This should give us a satisfactory margin on this side of the water, when we take into consideration the heavy overhead expense of European agriculture, due to the enormous taxation, which is paid directly by the farmer, and is also reflected in general commodity and operating cost. Rents and land values are high. Expensive commercial fertilizers are an indispensable part of good farming. Obviously, there is a point below which the European farmer simply cannot afford to sell, and in view of his controlling position in respect to volume of supply, it is absolutely unthinkable that the fluctuation of the present comparatively small overseas export supply could so demoralize world prices in any permanent fashion that the price basis would go much below the European cost.

3

I am assuming for the moment that the *modus operandi* under which wheat prices are now fixed, namely, the crude, relentless machinery of the law of

supply and demand, will continue to function indefinitely. But there is really no particular reason for that assumption. From the moment the human being ceased to be self-contained and self-sustaining, the law of supply and demand commenced to regulate production and prices of services and commodities. Those in command of capital found ample opportunity to exploit labour and the small producer of the staple articles of food. Through the power of cohesive action, however, labour became emancipated in modern times and now dictates the terms of employment irrespective of this natural law. It is, therefore, absurd to argue that the operation of the law of supply and demand must be accepted as the last word in the adjustment of wheat prices on the world's market. Organized labour has clearly demonstrated that such is not necessarily so. Industry, through combination, has done likewise. Railway rates are not fixed by this natural law, but by duly constituted authority. In other words, the answer to the problem is organization.

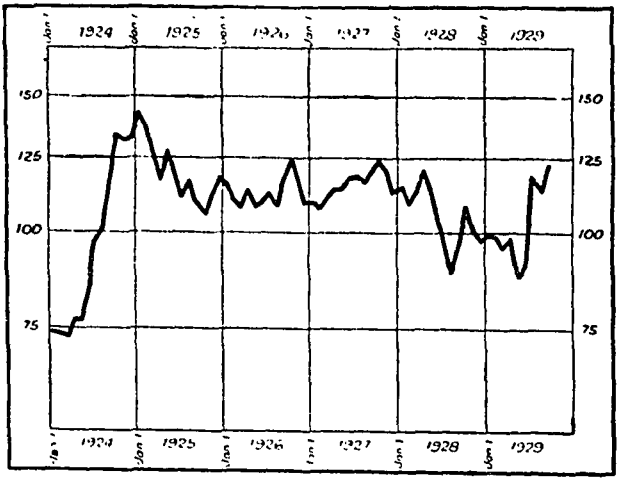
It is perhaps a misnomer to use the word "law" in connection with the incidence of supply and demand. It is rather a statement of this fact, that the quantity of any commodity demanded in the market will equal the quantity supplied at a given price in any market. We have travelled far in our knowledge of political economy since the days of Adam Smith and his assumption of equal bargaining power on the part of buyer and seller. In the complexities of modern society such an assumption has no place. The materialistic philosophy of the author of "Wealth of Nations," based as it was on individualism, has yielded to a social philosophy with group action as its foundation and social interest as its goal. Concentration of

control is the outstanding characteristic of modern business. Opposition to this concentration has been swept aside and each year has seen greater and greater concentration of control. This has increased the bargaining power of these groups in the market and has placed the individual at increasing disadvantages as a bargainer.

Agriculture is the only productive industry still under the yoke of this antiquated and relentless system of remuneration, and solely because of the difficulties in the way of complete, defensive organization. It is true that even organized labour cannot wholly escape from the operation of natural laws. They can, and do, dictate in respect to wages and conditions of service, but they cannot compel society to give them employment. But even that disability is being remedied through insurance against unemployment. Likewise, farmers

PURCHASING POWER PER BUSHEL OF CANADIAN WHEAT

(Corrected for Normal Seasonal Fluctuation: Base = 100 = Average Figure, 1922-1926)



could, through organization, fix a minimum, base price of wheat, but could not, in years of over-production, ensure the sale of it all. Labour can (and often does) through an unreasonable wage scale discourage employment. The farmer could, through forcing an unduly high price of wheat, curtail the consumption of white bread and would inevitably suffer the consequences of such an injudicious policy.

There is, therefore, a distinct limit to the possibilities of price control. But no thinking person will dispute the assertion, that there is neither rhyme nor reason in any price regulating system that keeps the greatest body of producers in the world continually on a basis of the lowest price margin to which they are grudgingly prepared, or compelled, to submit. Such a system is absolutely out of tune with the spirit of the times. As long as all classes were unorganized and natural laws held complete sway over the price situation all along the line, the farmer had fair justice meted out to him and had no grievances. But under a lop-sided economic system, such as the present, where certain important classes, through combination, effective organization, protective tariffs, immigration exclusion laws, etc., are almost immune from the operation of the law of supply and demand, resulting in comparatively fantastic prices for services and commodities, which the farmer has to pay, while he still sells his main products on the bargain counter, it is abundantly evident that his occupational group is labouring under an almost unbearable handicap.

4

The age-old complaint of the farmer the world over has always been, that he receives too small a share of the

CHAPTER THREE

THE WHEAT POOLS AND PRICE CONTROL

The organization of the Canadian wheat pools in 1923-4 marked a milestone in prairie agriculture. The three provincial pools now have a central selling agency, the Canadian Co-operative Wheat Producers Ltd. In Alberta, Saskatchewan and Manitoba there are 133,000 members. Over half of the farmers in the three provinces are members of the pool. The pool owns 1,417 country elevators, which have a capacity of 52,560,000 bushels. The pool owns or controls 12 terminal houses, which have a capacity of 33,606,000 bushels. These elevators were financed by a reserve fund which was created by collecting 2 cents on each bushel of grain handled. The 1927-8 pool had a gross turnover of $323,000,000 and handled 222,908,000 bushels of wheat. The pool organization enjoys the distinction of being the only business in Canada with an average turnover of more than a million dollars for every working day in the year, and is to-day, undoubtedly, the greatest single factor in the world's grain trade.

In brief, the leading idea behind the pool organization was perhaps, that the farmer had hitherto been completely at the mercy of the grain trade, which, however efficient it might be, had only a comparatively trivial interest in the price of wheat. The dealer, of course, makes his trading margins on low wheat just as he does on high wheat. It was felt that the time had come when the farmer could no longer remain a passive partner in the marketing branch of his enterprise. It seemed obvious, that the blind acceptance of

whatever price prevailed at any given time, without offering the least organized resistance through the systematic withholding of grain from a glutted market, or through other means of exercising a limited influence on prices, was a glaringly inefficient and uneconomic policy. No manufacturer could exist without some sort of control over the selling price of his product. The situation of the farmer is exactly the same. The farmer is obviously in a preferred position when the agency controlling the marketing of his wheat is wholly responsible to him for results. There can be no sound argument against the preponderating producing group within the nation taking up this very rational position.

There has been considerable speculation as to the extent to which the Wheat Pool organization, which now handles well over fifty per cent. of the total western wheat crop, can influence the net price received by the farmer. It seems to me that the case may fairly be summed up as follows:

(1) By an efficient system of marketing at cost, it can save for the benefit of its patrons the net profit collected by private grain handlers. This has, in the past, been sufficient to build up a number of large fortunes and is, therefore, an item to be taken seriously.

(2) Through quantity handling, it should be able to effect worth-while economies in this process, passing on the saving to the grower.

(3) By the orderly marketing of the enormous volume of wheat under central control it can undoubtedly exercise an influence on prices. It will perhaps be able to eliminate violent day-to-day and week-to-week fluctuations. The basic price, however, will always be determined by volume of world production. It is in salvaging for the farmer the odd cents per bushel that

the Pool will render beneficial services. It cannot, of course, perform miracles and suspend the law of supply and demand, but it can, and does, act as a market stabilizer. The exact effect of this influence cannot be stated in terms of dollars and cents, but common sense tells the unprejudiced mind that this influence is a real factor from which wheat growers the world over benefit.

(4) By having absolute control of the wheat, from interior elevator to final destination, it can positively assure growers that any profits from mixing and raising of grades find their way into their own pockets and do not serve to enrich the grain trade. I do not know to what extent this is, and has been, practised by the trade in export business, but I do know that this practice has been a source of suspicion and bitter complaint on the part of western growers for a generation.

It might appear that the degree of security and ultimate profit the Pool system offers the average grain grower should ensure almost a hundred per cent. support. The only weakness I see in the system is the fact, that the Pool grain is paid for in instalments and not in full, as by the grain trade, which assumes immediate ownership. I rather suspect, that this feature is the real obstacle to a hundred per cent. organization. It is human nature to demand the earliest possible returns, particularly when a farmer has waited the whole season to realize on his work, and when the pressure of liabilities is often severe. If that assumption is correct, the Pool will gain new recruits as farmers get into a better financial position. But, in the meanwhile, it is well to remember that "cash on the nail" is a commodity for which business invariably exacts a very

substantial premium. As it becomes apparent that this accommodation is paid for, farmers will rally to the support of the pool.

2

I am frankly sceptical in respect to the feasibility of any world-wide organization of wheat growers for the sole purpose of exercising price control. But relief is possible without the power of a hundred per cent. organization. The governing factor in the situation is the export surplus, which is produced by comparatively few countries. Canada is now the third largest producer of world wheat and the largest exporter. It will be conceded that the logic of events renders it certain that Canada's wheat exports will increase decade by decade. Our rate of increase is normally 12 per cent. per annum. Canada will probably be the only country that will show a substantial, steady increase in wheat exports. We are now supplying fifty per cent. or more of the world's import requirements, and will, consequently, be the one important factor in the export market. With the advent of the wheat pool a mighty forward stride was made, and the subsequent amalgamation of scores of smaller independent grain companies will ensure that Canadian export wheat will now be handled by concerns controlling large volume and able to feed the market intelligently.

That I am not over-estimating the influence on world prices of concentrated marketing will be clear from the following extract from a recent issue of a German periodical, devoted to the grain trade,

which has the reputation of being well informed on the subject:

"During Wednesday from the morning until the afternoon an advance of 8 to 10 cents per 100 kg. (about 4 bushels) was paid, and the following day sales were made in some grades at precisely 10 cents less.

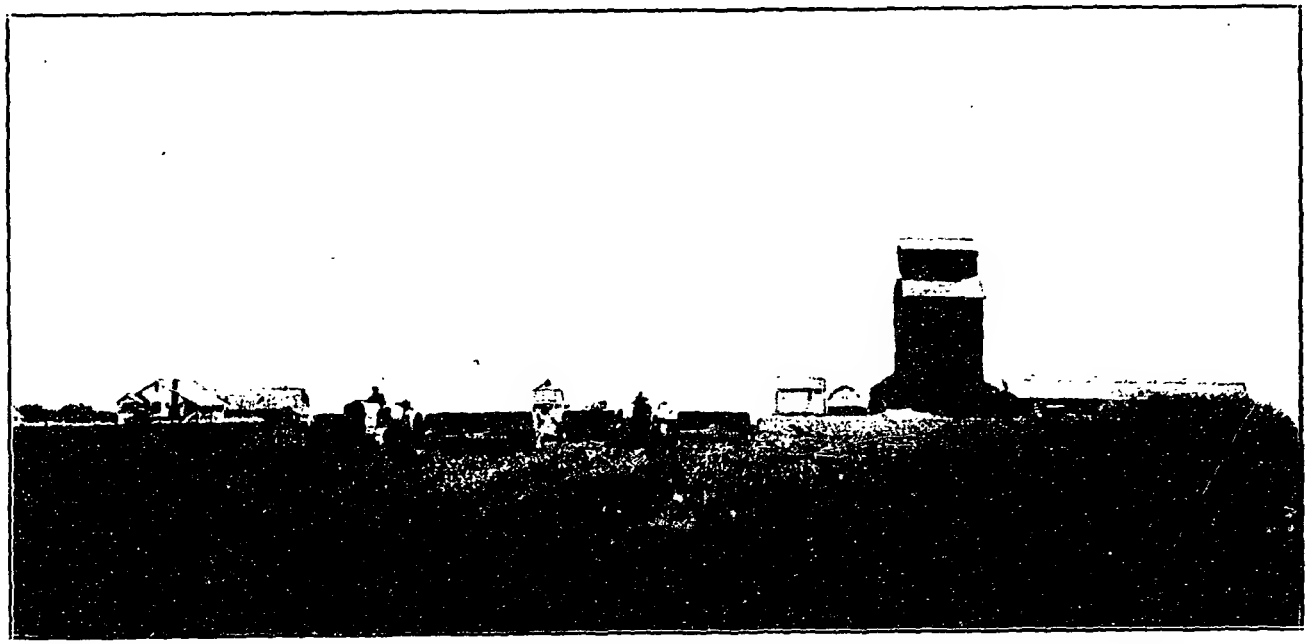
"Just as unjustified as the advance of Wednesday, was the decline of the previous Tuesday, which had been caused by rumors about disharmony among the directors of the Canadian Pool. Nothing could have vindicated the existence of the Pool better than the attitude of the market on the occasion of the first rumors about differences in the direction of the Pool's affairs. If the market could decline about 8 to 12 cents as soon as these rumors were broached, what would have happened if these rumors had been based on facts? Moreover, on due consideration it should have become evident at once that the reasons given for these differences were absolutely unfounded.

"The selling policy of the Canadian Pool during the recent campaign has been good. Canada has exported up to the present no less than about 7,500,000 tons of wheat. How much more could the Pool have sold? The arguments that the Pool has given Argentine too much elbow-room, and through the policy of keeping prices up, have enabled Argentine to dispose of about 3,000,000 tons of her wheat, are wrong, because if the Pool had been pressing on the market with cheap offers, Argentine would have followed this movement on a larger scale. The Canadian Pool never could have prevented Argentine from selling a huge part of her crop. Argentine would in all instances, have cut the prices of the Pool. The policy of the Pool was, under the actual circumstances, the only just one and if the history of the last year is going to be repeated, and the remaining quantities of Manitoba wheat, which this year are particularly large, will have to be sold at much lower prices, this will not be the fault of the Pool's selling policy, but simply due to the eternal and unalterable law of supply and demand.

"We have in this place from time to time criticized faults by the Pool's directors, caused by human frailty, but we can only approve this time the general line of the Pool's policy. A third transitory advance in our markets was caused last Friday, when after a day of direct depression, all at once, the fact that the bill for the support of the farmers in the United States was passed, made Europe, and particularly Liverpool, very nervous. But this phase was finished in about two hours."

The following is the editorial opinion of the "Wheat Growers' Journal," of Kansas, on this subject:

"According to figures compiled by the United States Department of Agriculture, for eight years prior to the introduction



A MONUMENT TO THE SUCCESS OF POWER FARMING.—Lake View Farm, consisting of *nine* sections of land near Harris, Saskatchewan, is farmed by the three Wilson Brothers. Only one of these men actually lives on the farm. The only horses on the place are two teams kept for light hauling and garden cultivation. All motive power for field work is supplied by four McCormick-Deering tractors, and the necessary power machinery. Each tractor is equipped with electric lights, front and rear, and eight drivers work in three shifts to keep the field work going night and day. Plowing, disking, drilling, and summer-fallow tillage are performed on a 24-hour basis.

tion of pooling, the average price of wheat at Minneapolis was 7¼ cents higher than in Canada. These figures exclude the war period when wheat was under control. However, when the Canadian wheat pool was inaugurated in 1924, the position was immediately reversed, and in a few months Canada's wheat commanded as good a price as that of the United States. During the second year of the pool's operations, the price of Canadian wheat averaged 10 cents per bushel above American prices. Since 1925 Canadian wheat has consistently secured a price above that of the United States, and on July 18, 1929, there was a difference of 27½ cents between Winnipeg and Minneapolis quotations."

The curious spectacle of importing U. S. wheat into Canada, paying 12 cents duty, has recently been complained of! These opinions would seem to indicate that there is a solid foundation for the claim, that the organization of the wheat pooling system may prove of vast economic benefit to prairie agriculture in Canada.

3

Completely successful pool price control cannot possibly be attained no matter to what extent wheat growers organize, owing to the impossibility of regulating the production of grain. Increased prices will bring increased production, and the only thing that will decrease production, aside from acts of nature over which man has no control, is a lowering of prices; for it must never be forgotten that farms produce only the raw materials of three things—food, shelter, and clothing, and that all three of these are produced all over the world. There is a constant tendency, furthermore—due to the inclination of human beings of all races to avoid manual labor as far as possible—to produce those farm crops which may be raised with a minimum expenditure of human energy; viz., small grains. The price question must be approached from quite another angle.

The over-production problem might, however, conceivably be solved to a degree sufficient for all useful purposes, through farm storage facilities and a plan of financing the surplus. It is conceded that, over a period of years, world wheat production has not in the past exceeded normal demand. It is within the realm of possibility, that pool organizations the world over might co-operate in gradually developing a system of economical farm storage in years of over-production, so as to hold off the market the comparatively small surplus that easily demoralizes prices. The new Federal Farm Board in the United States is organized precisely to finance price stabilizing enterprises of that nature. Other large exporting countries would presumably provide machinery and funds for the same purpose. In fact, the United States and Canadian pools, acting co-operatively in this matter, could control this situation without concurrent action on the part of other wheat exporting countries. The Federal Farm Board, with the enormous resources at its command, is at the time this is written, proceeding with a careful investigation of grain storage facilities, and may take the initiative in the matter.

Brazil has had a similar plan in operation for years in respect to coffee, which has proven reasonably successful, although at the moment over-production—the inevitable result of high prices—threatens to break down the policy of controlled marketing in that country. Undoubtedly, the present trouble is directly traceable to the unprecedented world crop of 33,500,000 bags in 1927-28. If the Defense Institute had not adopted strenuous measures at that time, the decline in price would have been much more severe than it was, and the recovery of 1928 would not have taken

place. The maintenance of the price, however, has had the inevitable effect of encouraging output, with the result that the authorities are holding back immense quantities of coffee that must be sold at a low price unless it proves possible to hold the coffee for some time. Even a long delay in marketing the present stocks would depend for its success upon the size of future crops, and there is no assurance that production will decrease in the early future.

The Defense Institute does not itself carry the coffee withheld from the market. When growers store their coffee in the regulatory warehouse, they obtain receipts on which they can borrow about one-half of the market value of the product. The balance is received when the coffee is finally sold. Therefore, the power of the Institute to maintain the nominal price of coffee is limited only by the capacity of existing warehouses and the speed with which new ones can be built. The difficulty is that, as stocks accumulate, growers have to wait longer and longer for their final returns. Dissatisfaction with this situation has led to attempts to smuggle coffee out of the interior by way of unregulated ports, and more stringent regulations for the shipment of the current crop are to be enforced.

The State of Sao Paulo, Brazil, is the greatest coffee-producing area in the world. Coffee growing has been a large-scale industry in this region for many years, and many of the trees have reached an age at which they are no longer economically productive at low price levels. Some of the old trees have, of course, been abandoned, but not enough to offset the effects of the new plantings. The owners of the younger

trees, which can be profitably cultivated under normal conditions, are naturally less inclined to favor the protective scheme than the others.

One difficulty encountered by the Defense Institute in regulating the flow of coffee is the location of the regulatory warehouses in the interior of the country instead of at the ports. The result is that a good deal of delay and confusion has been experienced when an effort was made to ship large quantities of coffee to the principal markets in a short time. But steps have been taken lately to remedy this situation.

It should be noted that the problem of controlling the price of coffee is peculiarly difficult because coffee is a staple product with a very inelastic demand. Consumption responds slowly to changes in price and to efforts to stimulate demand, so that equilibrium depends almost entirely on the adjustment of output to market requirements.

Other attempts have been made to stabilize prices, notably the British organization to control rubber. This finally broke down through over-production in countries outside the agreement. The "Cuban Single Seller Agency" aims to control sugar prices. It is too early to arrive at definite conclusions as to its effectiveness. At the time of writing, it appears willing to recede from its position on prices, which would indicate weakness. Over-production and lack of adequate storage are the difficult problems facing controlled selling.

With the general introduction of the combine harvester and the truck, which will admit of the rapid delivery to the interior elevator of the season's crop, a transportation problem will presently arise

in Canada and the United States, which will render imperative the early development of farm storage on a sufficiently large scale to distribute the transportation load over a longer period. These storage facilities would probably be extensive enough to take care of any surplus crop. The problem of financing a non-perishable commodity like wheat over a season of overproduction is a comparatively safe and simple one. The bane of the wheat growers existence to-day is not altogether a basic, average price of wheat too low for profitable production, but rather the violent fluctuations of the market, with its morale destroying consequences. It is reasonable stabilization he demands, and any plan that will contribute towards that object will be hailed with delight.

Average prices and average stability have constituted the staple of demand on the part of economists, and much of the debate that has gone on has been based upon the assumption that there was practically free competition, or at least a free play of competitive forces at work to bring about adjustment to a mean. It must be remembered that every price made is the result of an actual bargain and sale. It does not establish itself automatically, but comes at a result of negotiation or fixation by someone. Thus the concerns which name prices have evidently a duty to perform in this matter—that of establishing their prices upon as stable a basis as possible.

Wheat hitherto has always encountered a "buyer's" market. With fifty per cent. of all export wheat now controlled by Canada and marketed by a few large concerns, the "hard boiled" crew of Mark Lane manipulators may find that they can no longer have it all their own way. Any very substantial increase in

average world prices cannot perhaps be attained, but the present basis of paying only the very minimum at which farmers will raise wheat in years of normal production, may conceivably be changed to include a reasonable profit, i. e., adequate remuneration for the labour of the farmer himself, and reasonable return on his capital investment. There cannot be the least doubt that increase in volume of Canadian wheat, concentrated sales organization, plus business "backbone," will have a very marked influence on future world prices. And we may take it for granted that the Wheat Pool will develop ample "backbone," and will be a match for the rumour mongers ever on the alert to depress prices.

4

That the Canadian producer has a very keen interest in the wheat marketing systems of other large exporting countries is obvious. It is a well-known fact that Argentine wheat has been a disturbing influence in the world's market, owing to the inefficient system prevailing there. An official of the Canadian Pool, stationed in that country, recently described the situation there as follows:

"When there were neither cars nor storage the sacked wheat was piled under tarpaulins outside the station. The grain in the outside sacks was liable to become bleached—lose weight and color through alternate wetting and drying. The elevators at the ports were very small and antiquated and entirely in the hands of the buyers. When they were full the stream of grain began to back up, with resulting congestion; so the grain in port had to be rushed overseas, and in anticipation of this rush steamers were chartered weeks ahead.

"On the Rio de la Plata the situation was different to that at New York or Montreal with their constant stream of freight liners. There were few such on the La Plata; and most of the grain had to be transported in tramp steamers. Many of these came in ballast from Europe and had to be used whatever the

level of prices; otherwise there was heavy demurrage to pay. So even though the market price was low, the grain was shipped notwithstanding. It it could not be sold in advance, it went over on consignment; and the man who ships grain on consignment is absolutely at the mercy of the buyer. He must sell before it reaches the European port or incur heavy additional charges to add to his loss. . . . . .

"The Canadian Wheat Pool had had this condition to contend with, and it had been more serious than usual owing to the state of the world's markets. *Time after time had the Wheat Pool maintained the price level and even raised it, when Argentine wheat had again been thrown on the market and down has gone the price again. What was the solution? The only possible solution was that of co-operative marketing by the producer.* It must inevitably come; but under present conditions was absolutely impossible."

Under the former administration a commission was appointed to report on the improvement of the wheat handling and marketing facilities in that country. The government unfortunately met with defeat before the plan could be given effect to. The present administration, however, is said to favour a thorough reorganization of the present system, and until that becomes an accomplished fact, pool organization is, of course, impossible.

Throughout the wheat growing countries of the world activities are going forward leading towards complete control of the marketing of wheat. Australia, which has had experience of compulsory delivery in New South Wales, Queensland, and West Australia, is now preparing to take a federal vote to consolidate the wheat growing states in one national pool, entirely eliminating the speculative element as far as Australia is concerned. This is in line with the policy of the States mentioned where various agricultural, compulsory pools have been in operation for several years giving great satisfaction.

There is now every prospect of an era of orderly marketing of wheat prevailing in the United

States at a very early date. The whole scheme of farm relief there will be based on controlled selling through a federation of co-operative associations.

We may, I think, confidently look forward to a time, within the very near future, when wheat prices will not be swayed by every wind that blows, with the grower entirely at the mercy of the whims of the buyer. When the marketing of the great bulk of export wheat is in the hands of the direct representative of the producer, who will be held responsible by him for results, we may expect to see the end of the present pathetic situation, where wheat prices fluctuate in sympathy with every ridiculous, unfounded rumor that finds its way into world grain exchanges and bring loss and disappointment to millions of grain growers. The strong hand of systematic, bulk marketing will presently exercise a wholesome influence in steadying the nerves of the grain market.

5

We must discriminate carefully between the current price of wheat and the purchasing power of a bushel of wheat. It is the latter that has special significance. The important question in considering the world price of wheat is to determine to what extent this value equals or departs from the general price level of other commodities at the time. I have pointed out that dollar wheat colonized Western Canada a couple of decades ago. At that time the general price level was on a low scale and dollar wheat was attractive. Wheat has since advanced. At the time of writing, 25%. But general wages have increased 100% and commodities in proportion. This state of

affairs constitutes the great agricultural tragedy, particularly in countries where cost of production cannot be substantially reduced through farm mechanization. In North America the maladjustment is not so severe owing to reduction in producing cost, but average wheat prices are still vastly out of line with purchasing power. In considering the problem of limited price control, the point to bear in mind is, of course, that comparisons must be made not on a basis of arbitrary world wheat prices, but of purchasing power of wheat, which will vary from year to year in sympathy with the general price level.

Canada's best interest would perhaps be served by only a slight advance in basic prices of wheat, which we may reasonably look forward to. Very high wheat prices would lead to world over-production and unstable prices for a period of years, and would create a certain degree of agricultural demoralization during the transition period. The problem on our prairies is evidently to maintain a low cost of production in order to meet any and all competition. Large scale wheat production with us is mandatory. No other crop will take its place in view of our soil, climatic and market conditions.

Our wisest policy is, therefore, to so adjust our agricultural, handling and transportation techniques, that we can continue to land wheat in the overseas markets cheaper than any other exporting country on the globe. This will enable us profitably to maintain our present predominant position, which we ought to improve by every means within our power. An abnormally high price of wheat cannot, except in periods of world stress, such as wars or general crop failure, be maintained. History proves this conclu-

sively. Visions of very high wheat prices are, therefore, unjustified in our time. Our salvation lies along the much more labourious route of greater, and yet greater, production, handling and transportation efficiency.

6

I might add a word or two on the subject of the effect of the speculative element in the grain market. I am not certain to what extent the farmer suffers under the wild bull and bear operations that sweep our grain exchanges periodically. Some authorities contend that he profits, because the tendency is to purchase for a rise and that the gambler frequently supports the market. Be that as it may, the farmer views with apprehension the great fortunes made on the wheat market, and concludes that he himself is the sufferer. I am, however, inclined to believe that the unsuccessful speculator is the person who involuntarily contributes to the profits of the successful gambler. But it looks suspicious that the government of the United States, after a searching investigation into the transactions of the Chicago grain exchange, took power to regulate that body in periods where intervention was deemed advisable. Rollin E. Smith, of the Grain Futures Administration, wrote recently:

"In passing, the writer will say that he does not accept the theory that grain and cotton prices are constantly, nor frequently, under the influence of the "economic law of supply and demand." That is a term used by theoretical persons who have no practical knowledge of the markets—used to cover their lack of understanding, and is on a par with "Mother knows best," which is supposed to block controversy on the part of children regarding parental authority. "The price is made by the law of supply and demand" is a stock argument with many economists and is also systematically used as a smoke screen by members of grain and cotton exchanges. To say that the price is made by law of supply and demand is

equivalent to saying, "This ends the argument; there is nothing more to be said." Yet, no evidence has ever been produced, nor attempt made to prove, that the law of supply and demand governs the markets. It is merely a statement reiterated until it has become accepted generally as a fact.

"No, the law of supply and demand has been annulled so far as its operation on the grain and cotton exchanges is concerned. When a professional speculator can artificially increase the supply of wheat 10,000,000 bushels, say, overnight, by selling that much "paper wheat" in the pit, the law of supply and demand has been violated and not a policeman in sight. Prices of wheat, corn, and cotton are made in the futures markets of the exchanges, and not in the cash grain markets or spot cotton markets. Prices of the futures are the basis for transactions in the actual commodities—cash grain and spot cotton. Furthermore, prices in the futures markets never decline of their own accord. Nothing but selling can cause prices to decline; and selling in the futures markets is done by only two classes, speculators and hedgers. A sale in the futures market is made by a speculator who is either selling short or closing out a purchase previously made, or it is a legitimate hedging transaction. A sale in a futures market cannot be of any other class.

"Every decline in the futures market is, therefore, caused by speculators or hedgers, and at times by their combined operations. Now we come to the crux of the matter. The total volume of selling by speculators is enormously in excess of the selling for legitimate hedging account. Probably 90 per cent. of the selling in the futures markets is purely speculative. Thus the proposition reduces itself to its own logical conclusion. That is, as selling and nothing but selling causes prices to decline and as approximately 90 per cent. of the total volume of selling is done by speculators, it follows that speculative selling is the dominant factor in causing declines in the grain and cotton futures markets. This must be conclusive to anyone who will squarely and honestly face the proposition."

This is a pretty damning indictment of produce exchange operations and by a man "who knows." If ninety per cent. of the transactions on the grain market are purely speculative, one wonders what good object is served in permitting them. We are most meticulous about the morals of the "man-on-the-street." We will not permit lotteries or wheels of fortune. Gambling establishments are ruthlessly closed. Cigarette smoking even is discouraged by high taxation, and yet we cheerfully permit in our midst

the greatest gambling operations the world ever saw, even when there is at least a reasonable doubt as to their baneful influences on the farm prices of wheat. We are hardly consistent in our "uplift" efforts.

CHAPTER FOUR

THE WORLD WHEAT CONSUMPTION

There is so much conflicting testimony in respect to the probable future trend of the world's market for wheat, that it is extremely difficult to form intelligent opinions on the subject. We have on one side the school that predicts dire starvation within a comparatively short period, and is able to produce plausible evidence to prove the case. We have, on the other side, *de facto* over-production and a very recent narrow escape from a demoralization of wheat prices, which teaches a lesson that it would be well for us to learn and inwardly digest.

In spite of the veritable deluge of foodstuffs which commenced to descend on the world a number of years ago, which, we have seen, was partly absorbed by the unprecedented world population increase, and in spite of the fact that world agriculture is still in a state of depression through over-production, we cannot safely proceed on the assumption that food is going to be at a discount forever. In fact, Prof. East, of Harvard, after painstaking investigation, cheerfully tells us that if the same fantastic birthrate should by any chance continue, the world would be on the verge of actual starvation by 1960! This, of course, will not occur. A falling birthrate the world over is now providing the corrective, but it is clear that even with a greatly decreased birthrate ahead of us, the problem of food supply is going to be acute within a reasonably limited period. An important factor in the situation is the increasingly higher standard of living in Europe, the first effect of which is a greater consumption of wheat products.

To talk about actual world starvation under almost any circumstances that may arise is perhaps fantastic, notwithstanding the eminent authority who has written a lengthy book to prove his point. Society has several effective lines of defence before any such contingency could arise. First, a general curtailment of food to the point of maximum bodily efficiency and no more. This would be an excellent plan for humanity and would probably make the food supply go around for a lengthy period. If that were not sufficient to avert starvation society could readily enforce a drastic curtailment of the meat ration. Vast relief would be found in eliminating meat products, the most expensive part of our dietary system. Converting, as we now do, a thousand pounds of priceless grain, plus ten thousand pounds of other fodder, into 500 pounds of meat, one-third of which is inedible tissue and bone, and which has no greater food value than the original grain pound for pound, would at one stroke render available an enormous volume of human food, and would inevitably remove grain prices from the present anomalous level and put wheat at a premium.

Dr. Alonzo Taylor, discussing the limitations of food consumption and the future tendencies in that direction, says:

"The per capita need for food has declined and further decline is to be anticipated. The body uses food to maintain the body temperature, to sustain the tissues and to support muscular exertion. With improved construction and heating of buildings and with the decline in occupations entailing exposure, less food is required to keep the body warm. With substitution of machine for manual labor, less food is required to support muscular exertion. The gainful occupations may be graded into sedentary, light, moderate, hard, and excessive work, with requirements ranging from 2,400 to 6,000 calories per day. Gradually most occupations are gravitating toward the sedentary class. Probably schoolboys are now the group expending the most muscular energy.

"Also the average body weight is being reduced. With lowering of birth rate and death rate, the expectations of life is extended, which means more elderly adults with body weights below the average of other adults. Still more important, obesity has become socially reprehensible and is now medically condemned. The physician, the life-insurance company, the teacher of physical culture and the mentor of style join in extolling the slender figure. The lighter body requires less food to maintain it.

"The cumulative saving of calories thus secured is substantial. There is no way of estimating the contraction in demand for food corresponding to decline in muscular work. It has certainly amounted to several hundred calories per day per person. If one could apply to the population of each decennial census a correction for the reduced per capita consumption of food, the effect on the market for foodstuffs would be made abundantly clear. . . . . .

"The difference between foodstuffs and other goods and services in respect to saturation is obvious to everyone, though the implications are not adequately appreciated. Bluntly stated, the demand for food is limited by the size of the stomach; the demand for other goods and services is limited by the size of the pocketbook."

We may, I think, safely dismiss from our minds the fear of scarcity of world supply of foodstuffs within any period fairly susceptible to approximate forecast. There is, therefore, nothing on the horizon to justify any expectation of spectacular advances in prevailing average prices of farm products within the life of the present generation.

2

Normally, an increasing population would result in a corresponding increase in wheat consumption. This, however, is not an infallible rule. Changing food habits may, and have, become a large factor in the situation. It is evident that the people of Canada and the United States eat less wheat than during pre-war years. The figures south of the line, with which

Canadian figures closely compare, aside from our enormous per capita seed requirements, are as follows:

1927	4.1 bushels per capita
1926	4.3 bushels per capita
1925	4.4 bushels per capita
1924	4.8 bushels per capita
1909–1913	5.3 bushels per capita

The disappearance of wheat includes the quantity used for seed, which factor probably has not varied materialy in recent years. The food habits of the average Canadian and American have undoubtedly changed and is one factor which enhances the supply and reduces the price of wheat. On the other hand, this phenomenon, partly due to the prevailing modern fashion of eliminating starches in the diet so as to guard against over-weight, must yield before any impending scarcity of food supply, as wheat is the most economical food. It is also a manifestation of very prosperous urban conditions, when the tendency is to consume the more expensive articles of food, such as fruits, meats and dairy products, and reduce the consumption of the "staff of life."

Happily, per capita decreases in wheat consumption, except when dictated by economic distress, are not in evidence in our export markets. In fact, the tendency in most European countries is to discard rye for wheat in bread consumption as economic recovery permits it. Europe harvests an average crop of about 2,000 million bushels and requires about 2,650 million bushels to carry on. These figures represent averages, and are, of course, subject to weather and economic conditions, both ways. Europe's wheat imports range ordinarily from 625 to 675 million bushels per annum.

3

The increase in population of the white race has been extraordinarily rapid, and as the white man has always been the largest consumer of white bread, it is obvious that this fact is of great significance in considering the future of the wheat market. In 1800 the population of Europe was 180,000,000. In 1916, it was 465,000,000. European stocks outside of Europe increased 185,000,000. From 1800 to 1916 Europeans, at home and abroad, increased from 180,000,000 to 650,000,000. The great wheat-eating peoples trebled in 116 years. For centuries prior to 1600, they stood still. From 1600 to 1700, they increased a third. From 1700 to 1800 they increased a half. Then, with a sudden burst of procreative energy they increased 300 per cent. in a little over a century. We have already examined the reason for this extraordinary population increase. It is true that the birth rate is now falling in Europe as elsewhere, but this is in great part compensated for by the lowering of the death rate, through a very spectacular decrease in infantile mortality and to a general improvement in sanitation, standard of living and preventive medicine. Per capita wheat consumption in Europe before the war was 5.8 bushels in Great Britain, 6.4 bushels in Italy, 8.4 in France, 3.33 in Germany and 3.1 in Russia. It is certain that this will increase materially in present rye eating countries, such as Russia and Germany now showing a low wheat consumption. Between 1890 and 1928, the wheat consumption of the white race has more than doubled. A one and a half per cent. per annum average increase is now certain in the total present consumption

of wheat in countries inhabited by the white races, which is a cheering prospect for the Canadian producer. This would be equivalent to an average annual increase in imports of about eight per cent. The pools estimate this increase at from sixty to seventy million bushels, which perhaps errs on the generous side.

4

While Europe has always been the main factor in the export wheat picture, ex-European demand is beginning to assume a position of great importance and possibilities. During the period 1921 to 1926, inclusive, ex-Europe imported on an average 125 million bushels of wheat and flour reduced to wheat, per annum, which represented about 17 per cent. of total exports. This item consequently has a most important bearing on wheat prices. This market covers 130 countries in various parts of the globe. It is significant that this trade represents an increase of 50 to 60 per cent. between the pre and post-war periods, while the European trade only showed an increase of 5 to 6 per cent.

Canada is rapidly becoming a most important factor in supplying this market. It is estimated that within five years, with European exports ranging up to 675 million bushels, ex-European exports would approximate 200 million bushels, which would exceed one-quarter of the total world wheat and flour exports. The following export statistics over a period of years of wheat and flour to ex-European importing countries

by leading export nations, taken from "Wheat Studies," by the Stanford University of California, is interesting:

(Million bushels).

Year.	Total	United States	Canada	Argentina	Australia	India	Chile
1909	55.7	26.2	4.0	14.0	8.8	2.0	0.7
1910	65.8	30.8	4.7	17.1	10.0	2.1	1.0
1911	75.1	37.9	4.7	17.8	11.4	3.0	0.3
1912	80.1	41.5	5.4	19.2	9.5	3.6	0.9
1913	86.9	37.1	7.0	21.2	16.5	4.4	0.8
(Average) 1909-13	79.7	34.7	5.1	17.9	11.3	3.0	0.7
1921	104.6	44.4	6.1	14.1	19.7	3.7	1.5
1922	112.6	48.5	12.8	18.0	30.0	2.5	0.7
1923	135.4	64.3	19.8	18.0	29.2	2.9	1.2
1924	154.4	54.1	28.6	21.3	39.6	7.4	3.3
1925	115.3	36.7	22.5	19.1	34.2	1.5	1.4
1926	135.6	51.4	30.6	16.4	33.5	2.7	1.0
(Average) 1921-26	126.3	49.9	20.1	17.8	31.0	3.4	1.5

The following statement shows Canadian exports to ex-European countries between 1909 and 1926 inclusive:

(Thousand bushels.)

Year.	Total	North and Central America	South America	Asia	Africa	Oceania
1909-10	3,954	2,436	160	176	1,178	4.5
1910-11	4,669	3,434	228	91	906	10.3
1911-12	4,707	3,200	230	320	943	14.0
1912-13	5,433	2,965	302	598	1,568	.1
1913-14	6,953	3,618	458	1,451	1,426	.3
(Average) 1909-14	5,143	3,130	276	527	1,204	5.8
1921	6,095	4,032	766	501	796	.0
1922	12,814	5,589	1,247	5,075	903	.0
1923	19,773	6,974	2,133	8,939	1,727	.0
1924	28,603	6,389	1,916	18,654	1,644	.0
1925	22,486	5,440	1,524	14,169	1,352	1.3
1926	30,618	6,391	3,881	18,948	1,391	7.3
(Average) 1921-26	20,065	5,802	1,911	11,048	1,302	1.4

5

Japan and China are the countries that promise the greatest possibilities in an expanding consumption of wheat. It is a mistaken idea that wheat is displacing rice in importing Oriental countries. The food habits of these people change slowly, and there is nothing to show that the increasing imports of wheat have affected the consumption of rice. In fact, between the pre-war and post-war periods in Japan the per capita consumption of rice increased from 385 to 434 lbs., a much greater increase than in wheat consumption. The reason for higher wheat consumption must rather be looked for in a general higher standard of living. At the same time, the government of Japan is straining every nerve to increase the consumption of wheat in that country, deeming it in the interest of public health.

The situation in China is quite different. That country is one of the world's great wheat producing nations. Accurate statistics of production are not available, but it is estimated at from 500 to 700 million bushels per annum. This production is concentrated largely in the eastern provinces and in northern Manchuria. Generally speaking, the lower classes in the north of China consume millets, kaoliang and maize, the middle classes eat wheat flour and the well-to-do rice. In the south, rice is the staple diet.

On the whole it seems somewhat more reasonable to anticipate for the next few decades an increase rather than a decrease in China's net imports of wheat and flour. The demand likely to become effective if, as, and when political instability is reduced and economic progress accelerated, seems larger quantitatively than the probable increase in domestic

production. Variations in the quantities imported annually, however, will presumably always be considerable, if only because variations in the domestic crop are ordinarily large in all countries where wheat is produced in large volume. China, like Japan, will perhaps tend to import proportionately less flour and more wheat. The domestic milling industry is by no means underdeveloped and is apparently not ill managed, and with unhampered transportation of wheat and flour could probably supply the flour needs of the country without difficulty. Since fine, white bread is not extensively consumed in China, where wheat flour is largely used for noodles, etc., imports will doubtless continue to consist either of soft wheat and flour or of the lower and cheaper grades of Canadian hard wheat.

CHAPTER FIVE

THE WORLD'S WHEAT PRODUCTION

The wheat area of the world (ex. China and Russia) covers about 232 million acres. This area gives an average yield of 13.33 bushels per acre. The total world crop (including Russia and China) is generally around 4½ to 5 billion bushels. The two greatest wheat producers are Russia and the United States, who frequently raise one-third of the total world crop. The United States now takes the lead in total production.

There is nothing to show that the present wheat-producing area of the world can be extended to any appreciable degree under normal price conditions. Experts have made the most contradictory claims in this respect. The extension of the world's wheat area, within limits, is not primarily a question of soil and climate. It is affected more by the cost of production and price of wheat, which, if high enough, will have the effect of bringing under cultivation enormous areas of marginal, low yielding lands, principally in districts of deficient rainfall, extensive areas of which are available in practically all new wheat-producing countries and in many throughout the older civilizations.

The following table shows the world's wheat production for the years 1927 and 1928, with the five year average for the years 1922-26, inclusive. Also the time of the year when the crops are harvested:

Countries.	1927	1928	Five-Year Average 1922-26	Calendar of the World's Wheat Harvest
	Bushels	Bushels	Bushels	JANUARY—
NORTH AMERICA—				Australasia
Canada	479,665,000	533,572,000	387,739,000	Chile
United States	878,374,000	902,749,000	807,378,000	Argentina
Mexico	11,519,000	11,025,000	10,374,000	
Total North America	1,369,558,000	1,447,346,000	1,205,491,000	FEB. AND MARCH— India Upper Egypt

Countries	1927	1928	Five-Year Average 1922-26	Calendar of the World' Wheat Harvest
	Bushels	Bushels	Bushels	
SOUTH AMERICA—				
Argentina	220,826,000	239,161,000	203,387,000	APRIL—
Brazil	4,960,000	4,203,000	4,392,000	Lower Egypt
Chile	23,286,000	33,524,000	25,754,000	Asia Minor
Uruguay	10,234,000	13,887,000	9,674,000	Mexico
Total South America	259,306,000	290,775,000	243,207,000	MAY—
AUSTRALASIA—				Algeria
Australia	160,671,000	116,184,000	128,520,000	Central Asia
New Zealand	7,952,000	9,200,000	6,640,000	China
				Japan
Total Australasia	168,623,000	125,384,000	135,160,000	U.S.A. (Texas)
AFRICA—				
Algeria	28,323,000	31,415,000	25,726,000	JUNE—
Cyrenaica	36,000	32,000	300,000	Turkey
Egypt	44,346,000	37,296,000	36,861,000	Spain
French Morocco	24,618,000	22,193,000	21,230,000	Southern France
Tripolitania	173,000	18,000	134,000	U.S.A. (Calif., Tenn.
Tunis	8,267,000	12,125,000	8,693,000	Ve., Ky., Kan.,
Union of South Africa	9,029,000	7,765,000	7,128,000	Utah, Miss.)
Total Africa	114,792,000	110,844,000	100,072,000	JULY—
				Rumania
	334,992,000	289,781,000	352,165,000	Austria-Hungary
	29,221,000	31,186,000	27,203,000	Southern Russia
	9,043,000	8,595,000	9,812,000	Germany
Syria and Lebanon	14,582,000	6,490,000	12,100,000	Switzerland
				France
Total Asia	387,838,000	336,052,000	401,280,000	South England
				Eastern Canada
EUROPE—				U.S.A. (Ore., Neb.,
Austria	11,960,000	12,055,000	8,982,000	Minn., Wis., Colo.
Belgium	16,276,000	17,778,000	12,854,000	Wash., Iowa, Ill.,
Bulgaria	47,346,000	50,691,000	32,860,000	Ind., Mich., Ohio,
Czecho-Slovakia	40,384,000	41,434,000	35,105,000	N.Y., New Eng-
Denmark	9,408,000	12,125,000	8,497,000	land States)
Esthonia	1,079,000	1,103,000	742,000	
Finland	1,064,000	879,000	808,000	AUGUST—
France	276,126,000	277,655,000	272,432,000	Holland
Germany	120,521,000	141,592,000	96,244,000	Belgium
Gt. Britain & N. Ireland	55,777,000	49,761,000	56,291,000	Great Britain
Greece	12,970,000	15,676,000	9,830,000	Denmark
Hungary	76,933,000	92,037,000	64,117,000	Poland
Italy	195,808,000	228,596,000	203,621,000	Western Canada
Jugo-Slavia	56,568,000	96,364,000	62,676,000	U.S.A. (Dakotas)
Latvia	2,636,000	2,499,000	1,641,000	
Lithuania	5,273,000	7,275,000	3,831,000	SEPT. AND OCT.—
Luxemburg	701,000	799,000	392,000	Scotland
Malta	294,000	289,000	272,000	Sweden
Netherlands	6,156,000	7,569,000	5,607,000	Norway
Norway	605,000	676,000	560,000	Northern Russia
Poland	54,230,000	53,882,000	45,959,000	
Portugal	11,447,000	6,578,000	10,962,000	
Rumania	96,734,000	115,544,000	96,033,000	NOVEMBER—
Russia	745,885,000	859,789,000	673,913,000	Peru
Spain	144,824,000	122,640,000	142,709,000	South Africa
Sweden	16,152,000	19,470,000	10,566,000	
Switzerland	5,696,000	5,963,000	4,938,000	
				DECEMBER—
Total Europe	2,012,853,000	2,240,719,000	1,862,442,000	Burmah
				Argentina
WORLD'S TOTAL	4,312,970,000	4,551,120,000	3,947,652,000	

NOTE:—In the above table for the countries of the Southern Hemisphere, the years are 1926-27 and 1927-28, and the average 1921-22 to 1925-26. The average production in bushels for countries not included in the table are as follows: Irish Free State, 1,067,000; Scotland, 2,169,000; Guatemala, 222,000; Peru, 2,969,000; Cyprus, 2,283,000; Formosa, 63,000; Palestine, 3,232,000. The world's approximate average production of wheat is 3,959,657,000 bushels.

To this must be added the Chinese crop, ranging from 600 to 700 million bushels per annum. A brief survey of the situation in the principal producing countries will be useful.

2

With a present population of 72 to the square mile, and with the highest rate of increase in population on record, which actually reached 15 millions in the six years prior to 1926, necessitating an annual increase in food grains of at least 50 million bushels, and with her present aim towards a better standard of living, and taking into consideration lack of transportation, storage and grading facilities, Russia will scarcely resume her place as a wheat exporter to any appreciable extent, notwithstanding her present ambition to add five million acres to her wheat area, which is the program of the administration and upon which expert advice has been sought from the United States. The production of wheat in 1926 is officially estimated at 809,000,000 bushels, as compared with 713,000,000 bushels in 1925, and with an average of approximately 750,000,000 bushels in the five-year period immediately preceding the Great War. All these figures relate to the territory comprising Russia as it is now constituted; it is of interest to note, however, that the quantity of wheat raised in 1927 was almost equal to the average production in the entire area of the former Russian Empire.

With 85 per cent. of the population now engaged in farming, making every proper allowance for a somewhat crude system of agriculture, it may reasonably be concluded that, aside from expensive land reclamation, Russia cannot add materially to her

past volume of production. Wheat production on large areas, i. e., industrialized agriculture, will, in all probability show no increase in acre yield, although it may reduce the cost per bushel. Again, it is quite obvious that the central objective of the Soviet regime is urban, industrial expansion. The leaders have gained little support amongst the land owners of Russia, and the motive of self-preservation will naturally direct their efforts towards the creation of great urban, industrial centres. This will reduce rural population, as it has done elsewhere. It may, therefore, safely be concluded, that everything points to Russia's position amongst wheat growing nations being of dwindling importance as an export factor.

Siberia, with a Chinese immigration of a million per annum, is not likely to become a serious factor in exporting wheat to Europe. Not very much of that country lies below the 55th degree of latitude and it may, therefore, be regarded with scepticism as a great wheat-producing area.

British India is habitually on the verge of starvation and the products of any extension of her wheat area by means of irrigation development, will readily be absorbed at home over any period of years. There, as elsewhere, the standard of living is rising.

3

We hear much about the time when the Chinese dependency of Manchuria will enter the field as a competitor of Canada in wheat production. That country covers an area of 363,610 square miles, with a population variously estimated at from 13 to 19 million inhabitants. Its climate is much like that of our prairies. The soil is rich. The cultivated area is now

about 82 million acres of which 7 million acres is devoted to wheat. The main crop is soy beans, which occupies a quarter of the total crop area. Manchuria is being settled rapidly by Chinese. The movement into that country is estimated at 400,000 per annum. There are only a few settlements left of the Manchus, the original population.

A comparison of Manchuria with our prairie section is interesting and instructive. The area of our three plains provinces is 758,000 square miles, or more than twice Manchuria's area. The area under crop in the latter is 82 million acres; that of the prairie provinces 35 million acres. The population of Manchuria is probably 15 million, and that of our plains section 2 millions. On the face of it, the development of Manchuria to-day is at least three times as far advanced as that of our prairies.

It has 29 million acres of forests, and a large part is mountainous. In one province alone, 135,000 square miles are almost entirely covered with mountains. This is one-third of the entire area of Manchuria. There are also enormous areas of swamps and alkali deserts. Decidely, there is nothing to show that Manchuria contains anything like the arable area of our three prairie provinces, which is estimated at 147 million acres, one-third more than the area now cultivated in that country. So we must conclude that Manchuria is now nearing the point of its full agricultural possibilities, and the results of that development are not such as to cause any particular apprehension.

4

The Argentine has undoubtedly competitive possibilities. Whether they will be realized is an economic riddle. Argentina covers an area of 1,153,000 square

miles, 20% of which only is waste lands and 20% forests. The waste lands of the United States, it may be mentioned, amount to 58% of the whole area. Wheat growing is carried on in the central portion only, lying between the tropical country on the north and the cold, arid area on the south. The soil of this central area is very fertile, flat and devoid of stones and gravel. It is limited in extent, but irrigation development may become a factor in adding to the wheat area.

Argentine wheat is inferior to the Canadian product, That country, however, has certain superior advantages. Farm work is carried on during the entire twelve months, and summerfallowing is unnecessary, making the total acreage available for cropping each year. Labour and horse-power is cheap. Large farms predominate with a system of tenancy on small areas. On the whole, the land is poorly farmed. The system of handling the wheat in bags is expensive and antiquated. There is now a movement on foot to provide elevator facilities.

The wheat area of 20 million acres could undoubtedly be increased by 50%, through breaking up the alfalfa areas, but this policy would involve the question of whether wheat would pay better than live stock, which is purely a problem of price. The average yield per acre is just over 11 bushels, which is very much below our prairie standard. Improved marketing and handling would give a greater net return to the grower.

The Argentine has exported to Europe between 94 and 172 million bushels annually during the past five years, according to the domestic crop situation. She has also exported to ex-European countries, principally to Brazil, some 18 million bushels. The

Argentine now produces up to 250 million bushels in favourable years; about one-half of the present Canadian crop in a good season. The production has more than doubled during the past 25 years.

5

The continent of Australia follows the Argentine in point of importance as an exporter of wheat. It has contributed up to 156 million bushels annually to the world's bread basket. Of this gross export, 125 million bushels went to Europe, and 31 million bushels to ex-European ports, principally in Asia and Africa. Only one per cent. of her land is under plow at present and under a decidedly extensive system of cultivation. Labour cost is very high and strikes are of great frequency amongst agricultural labour. The fertile part available for wheat is the outer rim of the continent in the south, and there does not appear to be any possibility of extension, under normal price conditions, even through the aid of irrigation, owing to scarcity of water. Under the stimulous of war prices, the wheat area was increased considerably some years ago, but receded in sympathy with lower prices. It now stands at about 10 million acres. Average yields run about 12 bushels per acre. Wheat growing there, with the low yield, high cost and poor quality, cannot be a very inviting proposition.

Pending the introduction of mechanical motive power, which is making considerable progress, the cost of horse feed, estimated at about $4 to $5 per week, is a very serious overhead expense and is due to the dry climate, forcing the price of wheat hay up to from $40 to $50 per ton. Another very expensive overhead cost is artificial fertilizer. Most of the crop land

is treated with superphosphate, owing to its deficiency in this mineral, which is so marked that even live stock will suffer from rickets and similar diseases unless phosphate is applied to pastures and hay crops. The value of land is also comparatively high in the wheat districts, ranging from $25 to $80 per acre. The railway situation is fairly favourable, but freight rates are high. The outstanding characteristics of the Australian climate is dryness to a degree unknown in Canada. This in itself will have a tendency to discourage any large development in wheat production.

There is, of course, a host of smaller overseas producing countries, such as Africa, Chile, Uruguay and Mexico, but their contribution is inconsiderable, less than one per cent., and shows no sign of expansion. It is true that there are huge, undeveloped areas in interior South America and South Africa, which may be considered available to augment the world's food supply, but, aside from the fact, that they are not the natural home of wheat, which is essentially the product of the temperate zone, it is a question whether they can be successfully colonized, even under pressure of scarcity of food, by a class of people likely to develop their agricultural possibilities. Clearing of very heavy timber and undergrowth would be an outstanding feature of tropical colonization. Even aside from the peculiar difficulties in the way of tropical clearing operations, the cost of which is enormous, owing to the rapid growth of underbrush, it is a fact, that land clearing anywhere of heavy timber—and even of lighter tree growth—practically never yields an ultimate land value to compensate for the cost of clearing. Few farms anywhere are worth the original cost of clearing per acre.

It is a fact that food is produced somewhat easily in the tropics; but, on the whole, the hot countries are not fitted for dense populations. Prof. East tells us in a recent book that great heat evaporates human energy as fast as it evaporates water, and this factor alone warrants us in not being too sanguine about filling the tropics rapidly. The fact to be emphasized in this connection is the low margin of safety for large populations in hot climates. Bacteria and fungi thrive as well as pineapples, bananas and cocoanuts. Storage and transportation of food is made very difficult. With such lands densely populated, the people exemplify a living from hand to mouth in perfect fashion. In addition, bacterial and protozoan human plagues are numerous and widespread. Infantile death-rates are very high from intestinal infections, and adult death-rates, always large from chronic diseases, spasmodically mount to terrible figures through epidemics having a virulence commonly unknown in temperate parts of the world. History does not show any cases of white colonization in the tropics, on a large scale, where the population exists on low-price products such as wheat. Any attempts to subdue the tropics have been confined to rubber, fruits and other high-priced crops. To all practical purposes we may dismiss tropical colonization in our time as a means of adding to the world's supply of wheat.

6

There now remains for consideration the situation in Europe (ex-Russia). That continent is still the most important factor in the world's wheat production. Looking over European acreage statistics, there is no

tendency revealed towards any noticeable expansion even under the stimulous of high prices. And yet there are important developments on the horizon which cannot be ignored. The war and its aftermath of hostile tariff legislation and financial stress, have impressed on most European countries the vital importance of the home food supply, as well as the virtue of curtailing imports of every description. Practically every nation there is now determined to produce the greatest possible volume of food within its own boundaries. This desire finds expression in redoubled efforts within the field of agricultural research, promotion of intensive methods in farming, also in improvements in transportation and in marketing machinery. These policies are unquestionably yielding important results here and there.

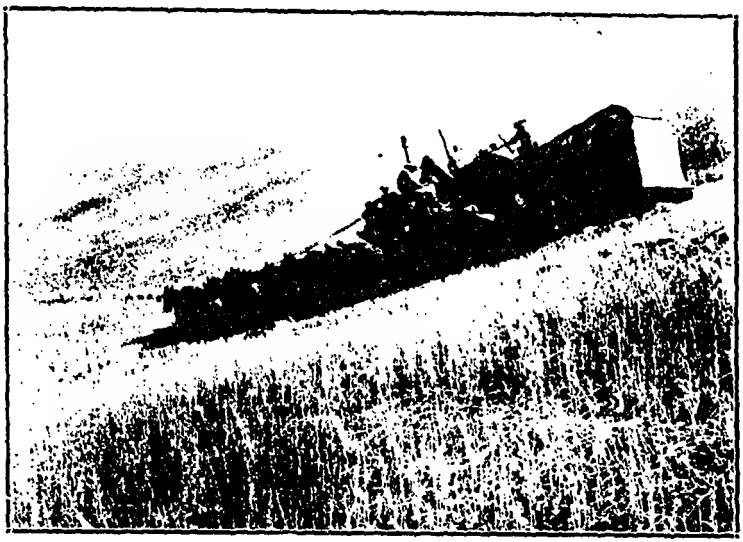
A characteristic example of these agricultural expansion campaigns, is the "Victory of the Wheat" in Italy, which country has outlined what is undoubtedly the most ambitious and concerted program of any nation in Europe. This event was celebrated in Rome, October 15, 1928. Premier Mussolini, in presenting prizes to those making the greatest progress in wheat production during the year, announced that the wheat crop of 1928 exceeded that of 1927 by almost one-fifth. This figure, however, does not really reflect the degree of progress in wheat production. Nineteen-twenty-seven was a poor wheat year for Italy. The crop was substantially below that of 1926, and much below the bumper crop harvested in 1925.

Nevertheless, the 1928 crop was the second largest in Italy since the war. The yield per hectare in 1928 was 13 quintals, as against an average of 11.5 quintals during 1921-1925. This, of course, represents a distinct

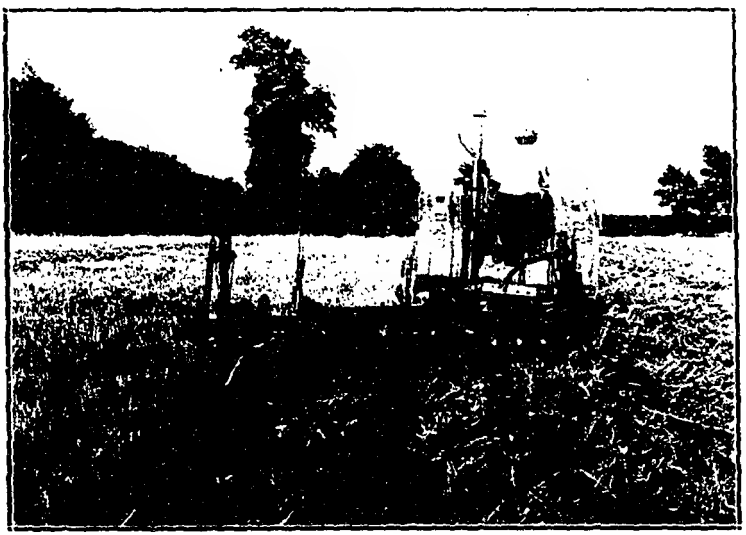
gain. A hectare is slightly less than two and one-half acres and a quintal about three bushels and a half. The announced objective of the "battle of the grain" is to raise the wheat yield to 17 quintals per hectare. Such an increase would not appear to be technically impossible. Switzerland manages to get as much as 20 quintals from a hectare of her land. But even such an increase would not bring Italy to the condition Premier Mussolini described with great eloquence at the October celebration, where he announced that his ambition was to reach "a condition where Italian soil will produce bread for all Italians."

It is perfectly obvious that this position could not possibly be attained with a stationary acreage, particularly in view of the high birthrate of Italy, and of the avowed policy of the Fascist regime to promote a rapid increase of population. The problem facing Italy then is to add to her crop area through land reclamation. It is a curious fact, that in spite of the dense population of Europe and the antiquity of her agriculture, there are still enormous areas of waste lands in several European countries that might apparently lend themselves to profitable reclamation.

It is estimated that there are in Italy, on the peninsula and on the islands, some five million acres which can be reclaimed or improved and made productive. The plan for 'integral reclamation,' which provides for the improvement of all this land within 14 years from 1929, was adopted by the Italian Cabinet of Ministers, July 25, 1928, and was formally approved by the Italian Parliament shortly afterwards. Plans have already been worked out to reclaim six areas, containing altogether 775,000 acres. This is the first instalment of the scheme. The work will include



Horse-Drawn Combine in the Pacific Northwest. Here the wheat is handled in sacks.



The "Wheatland Disc Plough." One of the new type of implements which is revolutionizing prairie farming technique.

drainage, regulation of water courses, construction of mountain reservoirs, irrigation facilities, rural roads and drinking water aqueducts.

One of the most interesting projects under this reclamation scheme is the work that has been carried out in the most abandoned and malarious part of the island of Sardinia, where 22,000 acres of part marsh land has been successfully reclaimed. The "*Natura*" of Milan describes the change that has taken place as follows:

"The agricultural transformation involved subdivision of the improved territory into administrative sections of about 2,000 acres each. Each was given a rural center or administrative colony consisting of the colonist's homes, stables, barns, cellars, granaries, a small office, and a power-house. A net of forty-two miles of electric lines of fifteen thousand volts is spread over each colony, and is the source of the electric supply.

"On the desolate plains, as they were before the improvements began, there was not a tree to break the monotony of the landscape. In an attempt to encourage forestry in this region, the first experiments were with the eucalyptus, as these trees seem to thrive in this particular kind of soil. They serve for ornamental purposes as well as for lumber. There are now at least two hundred thousand of the trees in this region, besides poplars and acacias.

"Grapevines cover 1,150 acres. The production of wheat in the worst season has exceeded 7,000 quintals (770 tons). The grass gives nourishment to numerous stock, among which there is an abundance of hogs and cows. In 1925 the six groups of rural sections had a capacity of 283 rooms, giving residence to 500 agricultural laborers, but on October 1, 1928, fifty more buildings were added with more than three hundred rooms.

"In 1929 this new cultivated land gave employment to fifty-four families, immigrants from Polesine, and to forty families from Romagna, Vincentino and Sicily. Altogether there are between fifteen hundred and two thousand inhabitants, and for them the society has provided all that is necessary in modern civil life. They have erected a beautiful church of rock from Monte Arci; they have built schools, a hospital with forty beds and with X-ray and surgical rooms, also grocery stores, public baths, a gymnasium, a hotel and a residence for the governor.

"This is the Italian village called Benito Mussolini. It was named in honor of the head of the Government, and is the pride of every one in the colony of Terralba."

Other European countries are also making efforts to increase domestic production through land reclamation. Poland possesses enormous areas of unreclaimed and unimproved lands. Although the bulk of her population is rural, she has in the past imported large quantities of foodstuffs; especially wheat and rye. Pending active reclamation work, that country is making every effort to make the land now under cultivation as productive as possible, and is straining her resources to import agricultural machinery. The use of artificial fertilizers has increased since the war. Poland has abundant supplies of potash and other minerals which can be worked into fertilizers, and a large part of its chemical industry is in the hands of the government, which is determined to develop the production of cheap fertilizers. Polish leaders do not expect their country ever to export grain. But they see no reason why Poland, with her agricultural resources, should be a grain importer, and they are bending their energies toward attaining a condition which will make it unnecessary for Poland to spend abroad the 20 or more million dollars a year she has been paying for wheat and rye.

Czecho-Slovakia, under the influence of agricultural protection and of consistent efforts toward better agricultural methods, to-day has a substantially larger yield per acre of wheat and other cereals than before the war. Austria embarked on a similar policy four years ago, and the expansion of her grain output bears witness to the success of her efforts. Germany has again, in the course of the past few years, returned to her pre-war policy of agricultural protection, and there is a steady pressure from her agricultural interests for still greater protection. France also is grappling

with the problem of increasing her wheat area. That country is now the greatest producer of wheat in Europe ex-Russia.

Even the grain-exporting countries of Europe are seeking increased production. Outside of Russia, the grain-surplus areas of Europe lie in the valley of the Danube, in Rumania, Bulgaria, Jugo-Slavia, and Hungary. Cereal production especially in the Balkan States, was discouraged after the war by political events and by agrarian reforms. This caused a serious check in wheat exports, which, however, may presently be partly overtaken. Roughly speaking, Jugo-Slavia is about three-quarters mountains and one-quarter valleys. Nevertheless, fully 45 per cent. of the total area, or 27,500,000 acres, is cultivated. The great Pannonian plain of the Danube, Save and Tisza rivers is a wonderful stretch of rich, black wheat soil. Corn, wheat, flax, potatoes, hemp, tobacco, hops, sugar beets and barley give good yields. In 1927, that country produced 50,000 small carloads of wheat for export, but were unable to sell more than 15,000 at the time at prices acceptable to the farmers. The Premier of that country recently admitted that there was no possibility of Jugo-Slavia being able to compete with North American continent in the export of wheat. I doubt if there will be so much wheat for export in the future from Rumania. But cereals will continue to occupy at least half of the 30,000,000 acres of arable land in the Kingdom. We may still look forward to large exports of corn, wheat and livestock products from Transylvania, Wallachia, Bukovina and the other rich provinces of Rumania. Bulgaria, with her small holdings, will scarcely add to her wheat exports. The tendency will be for home consumption to increase in all these countries, thus relieving the export market.

It is quite true that the population of Europe, especially Southern Europe, has increased very considerably since the Great War, and that the normal wheat imports would, therefore, tend to increase in volume, but, with the expansion policies mentioned, it cannot be taken for granted that this additional demand for foodstuffs cannot be met from domestic sources, even though it may be admitted that the business of wheat production on reclaimed lands would prove expensive, owing to the very large capital cost per acre, upon which interest or rental will have to be paid in perpetuity. This extra overhead cost may, however, in some countries be offset by high import tariffs in favour of domestic agriculture.

It will, of course, take many years to complete the very ambitious reclamation projects herein referred to. It is quite within the realm of possibility that many of them will be abandoned when it becomes clear, that the capital cost is beyond the productive value of the area to be reclaimed. The principal objective is wheat production, and it is quite obvious that this will impose somewhat narrow limits on feasible capital expenditures. At any rate, there is no indicarion of any easy road to considerably augment the European wheat area or production. The low cost production of the Canadian prairies will in all probability be more than a match for any competition in the world's wheat market arising from expensive land reclamation ventures in Europe or elsewhere.

The only danger point in the European wheat picture, as far as Canada is concerned, seems to be the possibility of the consuming masses there voluntarily submitting to substantial import taxation on wheat, in order to provide a bonus for domestic agriculture,

which might give an impetus to extensive land reclamation, and develop largely increased home production with the attendant fall in the normal world price of wheat. Such a tariff policy would, however, prove exceedingly unpopular, and, in view of the preponderating political influence of the urban communities in nearly all European countries, is an expediency which will only be resorted to under stress of national emergency, or as a consequence of special propaganda accentuating the patriotic motive.

The following table shows the development along tariff lines in three important European countries between 1924 and 1929:

	Import Duty Per Bushel of Wheat.	
France	15c.	53c.
Germany	Free	48½c.
Italy	Free	73½c.

France has never been a considerable importer of wheat, and it may be questioned whether this tariff provision can become effective. In Germany and Italy the effect will doubtless be to seriously curtail the consumption of white bread and to stimulate home production, largely at the expense of other foodstuffs, however. It is also open to doubt whether such fantastic import duties on essential foodstuffs can be maintained for any length of time from a point of view of practical politics.

CHAPTER SIX

WHEAT PRODUCTION IN NORTH AMERICA AND THE MARGINAL LANDS

We come then to the conclusion that any very considerable augmentation of the world's wheat area must be confined largely to the Canadian prairies and to the United States lying west of the Missouri River, the "Great Plains" of North America, where enormous areas of marginal lands are still available contiguous to the existing wheat fields, which are well supplied with means of transportation. To a limited extent, the same conditions apply in Australia, but the difficulty there is the long periods of violent drouth to which even the present wheat-growing sections are subject, and which largely destroy new colonization before it has had a chance to become fairly established.

These vast bodies of marginal lands will not be developed and retained in production unless wheat growing on them becomes a paying proposition, either through an increase in the price of wheat or through the introduction of labour-saving implements on a large scale. It is, therefore, difficult to forecast the future trend of the development of this class of lands in the United States, and to some extent in Canada.

Approximately one-third of Western Canada's estimated area of arable land is to-day alienated, though not fully developed. If we credit the people who selected this land with ordinary, common sense, we must conclude that it contains the cream of our vast, arable area. No agricultural country on earth would, in its virgin state, contain so large a proportion of high

quality land as one-third of its arable area. We must, therefore, admit, and anyone conversant with the facts will readily support such a conclusion, that our present unalienated, arable area falls distinctly within the category of medium to inferior lands.

To obtain a true picture of this situation, we must realize that the bulk of these lands come within the term "marginal." An examination of them would at once reveal the fact that nine-tenths are below par in quality. They are located in areas where the rainfall normally is insufficient to produce satisfactory agricultural results, or they are heavily treed, are low lying, stony or have thin soil or exhibit other undesirable features. They are, in fact, culls. Except in part of the "dry" areas, these lands present a problem in human labour, and are marginal only until reclaimed by hard pioneering effort, when they will graduate into the class of more or less productive lands. But their reclamation involves clearing, digging out of stones, drainage or similar uninviting and time-consuming labour, unproductive for the time being.

A depressing number of Canadians, Britishers and Americans have failed, at great economic loss and to the everlasting detriment of Canada, in establishing themselves permanently upon farms of that class in Western Canada. "Flivvers," rural phones and mail delivery can play no conspicuous part in such a toilsome undertaking. It calls rather for the Spartanic life of the early back-woods settler of old Canada, with something approaching the crude standard of living then in vogue.

2

The story is substantially the same south of the line, but in a somewhat intensified form, inasmuch

as the vacant, marginal lands there are largely of a character which might be termed "near-desert." It is also a fact that a much larger body of dry lands, with an average rainfall below the 10-inch mark, has been brought under wheat in the United States than in Canada, and in districts that are nearer submarginal than marginal. This phenomenon, the outcome of spectacular war and post-war wheat prices, has been an important factor in the present very acute "farm problem" in that country, which has engrossed the minds of statesmen there for several years and the solution of which would probably involve the abandonment of such lands on a wholesale scale. In the normal course of events, it would seem unlikely that the United States will contribute further acreage to wheat growing.

Events agricultural are not, however, likely to proceed normally there. A "Federal Farm Board" has been created composed of some of the most outstanding men in the United States. The chief problem facing this board is to make the present spectacular high tariff on wheat effective to the extent of raising the domestic price far above the supply and demand world price, and to dump the surplus production at whatever the latter price may be. But European countries will not be slow in enforcing special tariffs against United States surplus wheat, if it is sold in the overseas markets at a smaller price than at home. If this board succeeds, the high domestic price, which will affect 75% of the present total production, would undoubtedly stimulate the extension of the wheat area considerably, which would, of course, be resisted by every possible means, as it would virtually defeat the whole effort of the Farm Board and be highly detrimental to all wheat growers.

It is obvious, that the principal justification of the existence of the Farm Board is the problem presented by the present comparatively small margin of wheat production beyond the normal home demand, which automatically reduces the domestic price to parity with the world price, less cost of transport overseas. Tariff provisions, of course, remain wholly ineffective. It is, therefore, fairly certain that the Board will not be a party to any wholesale "dumping" of this surplus abroad and the consequent creation of an artificially high domestic price level, merely to add stimulous to a further unwarranted expansion of the marginal and sub-marginal wheat areas of the United States, in turn begetting an even greater export surplus than the present, which has been a source of worry and vexation for years, and has been chiefly responsible for widespread agricultural unrest and the demand for the recent ultra-radical farm relief legislation. How the Board is going to create a decided increase in the domestic price of wheat, without at the same time incurring the seemingly inevitable penalty of a decided increase in wheat area and production, is, by the way, one of the many conundrums in connection with farm relief legislation in that country, for which no one has yet suggested any satisfactory solution.

3

A very important factor in wheat production has been the release of millions of acres devoted to feed crops for the enormous number of horses hitherto required in extensive farming operations, and now being rapidly discarded with the wholesale introduction of mechanical motive power. These areas are now available for wheat production, particularly in Canada and the United States. This addition to the wheat area

is estimated at four per cent. of the improved land area, which would give us a figure of 20 million acres for the United States and 3½ million acres for the Canadian prairie provinces. It is obvious that this modern development in agricultural technique is largely responsible for the huge additional wheat production since the war years, particularly in North America. The same process is going on in modified form in Australia and in other extensive wheat growing countries. It is a factor to be reckoned with in considering the subject of wheat production. The process of introducing mechanical power is still going on, and we may look forward to further large areas being added in the future. That we are facing, within limits, the horseless era on our grain farms is certain.

4

In studying the possibilities of extending the world area under wheat, the high spot in the situation, as far as the present generation is concerned, is obviously that of prices. Past history and statistics indicate conclusively the high degree of elasticity of the world's wheat area. A considerable rise in the basic price of wheat would inevitably be followed by an extension of wheat growing on marginal and sub-marginal lands, as well as on lands now devoted to other, and less remunerative, crops, which would again be followed by a lower price basis, until this new competition was wholly or partly eliminated. We see this natural law clearly exemplified in our prairie country, where high wheat prices is invariably followed by curtailment in dairying and other branches of animal husbandry. The normal, annual increase in world wheat consumption would easily be absorbed by a comparatively small increase in area under wheat yielding a normal crop.

CHAPTER SEVEN

INCREASED ACRE PRODUCTION

Modern classification of wheat defines eight different botanical groups, the common names of which are: common wheat, club wheat, poulard wheat, durum wheat, emmer, spelt, Polish wheat and einkorn. In Western Canada we are interested practically altogether in the common and the durum wheats. The latter group is rust-resistant to a very high degree and has became very popular in recent years in Manitoba and South-eastern Saskatchewan. More than half of the Manitoba crop is now Durum. It yields somewhat higher than the common wheat, but takes a reduction in the market of from 5 to 15c. per bushel, and the market is limited, its use being confined to the making of semolina flour which in turn is used for the manufacture of macaroni, sphagetti, puffed wheat breakfast food, etc., To increase the world supply of wheat, we must increase either the yield per acre or the area under this crop, or both. There are undoubtedly possibilities in both directions.

It seems probable that experimentation with wheat covers a period of thousands of years. In modern times it has, of course, been systematized. About 2,200 years ago, Plato wrote: "There are many kinds of wheat which take their name strictly from the place where they grow. . . . They show differences in color, size, form and individual character, and also in regard to their capacities in general, and especially their value as food." New varieties of this cereal may come to the front, and, at least, for a time may have the effect of slightly increasing yields;

they may confer resistance to insect, fungus or bacterial pest, and thus avoid diminished yield. New technique may be developed in husbandry.

There will be progress of that nature from time to time, but the final effect will be rather to enable the wheat grower to maintain his present average yield than to substantially increase it. Revolutionary or spectacular discoveries in agriculture belong to fairy land. Professor East in his book: "Mankind at the Cross Roads," in discussing the possibilities of increased acre returns, says:

"There is absolutely no question but that the yielding power of the standard crops will be increased and their food value augmented. The ravages of insects and of fungi will be reduced by creating resistant types. Mankind will push agriculture northward and enlarge the dry-farming regions by using varieties adapted to the conditions met. But with all this, one must remember that no new processes are involved, and the few time-saving devices now being used—or in prospect of being used—for the evolution of new forms of plant and of animal life are not going to increase the resources by leaps and bounds. The prospective increase is relatively small. Similar development has been going on for thousands of years, and the labor-saving methods just described will only hasten matters a little. There will be no revolution. . . . . .

"We have been regaling ourselves by dreaming about agricultural miracles, which would set everything right. Let us awaken to realities, and examine the old art of agriculture as we actually find it. After all, the brightest ray of hope for an increasing return per unit area is from efficient application of the best methods of crop rotation, tillage, protection, harvesting and marketing, made possible by increasing the amount of manpower used. There is no royal road to raising turnips. If we do this calmly, without bias, and accept frankly the statistical results coming out of the mill, five conclusions will be reached:

"1. The people in the United States revelled in cheap food in the past because low-priced land was so plentiful they could be satisfied with whatever returns were obtained by the hasty, inefficient methods of culture made possible by the powerful tools of industry.

"2. The reserve of virgin soil approached an end in quantity, or, what amounts to the same thing, decreased markedly in quality, between 1890 and 1900. Since that time there have

been diminishing returns in agriculture in the sense that a given amount of capital and of labor has produced constantly less and less.

"3. Better methods of agriculture will allow enhanced production per unit area amounting to at least 50 per cent. over the current amount, but this will only come about through an increased use of man-power.

"4. All increase will be temporary, and even current production cannot be maintained, unless the essential elements of soil fertility are conserved by every method possible.

"5. If comfort and satisfaction on the farm are not equivalent on the average to what is obtained in other walks of life, if agriculture is to be at the mercy of powerful industrial labor-unions directed by narrow, scheming opportunists, or stifled by the short-sighted greed of capital, this machine-made civilization of ours will shortly burst like a tree which is rotten at the heart.

"Such general application of improved agronomical methods as has come about in the United States in the past generation has yielded valuable results; but these are difficult to demonstrate statistically. Wheat yields by decade averages centering on the census years 1866 to 1915 were 11.9, 12.3, 12.7, 13.5, and 15.0 bushels per acre. Indian-corn yields for the same periods were 26.1, 25.5, 23.4, 25.2, and 26.6. Other crops showed similar trends. There were slight increases in production per acre, but the percentages rise is disappointing. Collateral evidence shows the true increase in production due to better farming to be really worth while; it may be as high as 50 per cent. in half a century. The difficulty in proving this directly is because it is offset and masked by the poorer new lands brought into cultivation, and by the impoverishment of certain of the older lands."

2

I do not agree with all of the above conclusions, but applying them to the world wheat area generally, and not exclusively to the United States, it is obvious that increased production by means of better farming, using that term in a very comprehensive sense, does not look promising. European agriculture, for instance, cannot hope for any very material advance in yields through "better farming." It is, on the whole, fairly efficient to-day. The point of Prof. East's conclusions is, of course, that decidedly better yields

involves decidedly more capital and labour expenditure per acre. This remedy is feasible to avert any impending world-wide food shortage. As an economic proposition, i.e., as a means of increasing the money return on agricultural operations, it does not seem to be a particularly inviting remedy, and, therefore, will not be of practical application until the danger of food scarcity advances wheat prices to the point where intensive methods will pay a dividend to agriculture. We are far removed at present from such a contingency. The element of cost of production is the determining factor in farming, as it is in every other line of productive industry. The higher acre yield will come as soon as it is clearly shown, that the return from it is greater than the cost of producing it, which is not the situation in our prairie section to-day.

We cannot, of course, overlook the fact that the Great Plains section of North America is as yet practically a virgin country with a very short period of agricultural experience behind it. The time element in agricultural practice is always important, and accumulated experience is a factor to be reckoned with the world over. It is interesting to read the following conclusions respecting the future of wheat production in this area by Mr. E. C. Chilcott, in charge of "Dry Land Agriculture" for the United States Government. His remarks apply, of course, with equal force to that part of the Great Plains section lying north of the International Boundary:

"In the eastern United States, where the land was originally heavily timbered, it usualy required about three generations—a hundred years—to clear a farm of from 100 to 200 acres and bring it into full production. During all that time there was accumulating the results of practical experience on each particular farm. It is doubtful whether any member of the third or fourth generation that has grown up on such a farm ever fully realized that the

traditions that he inherited were the most valuable part of his estate. It is still less probable that any owner of a virgin farm in the Great Plains could be convinced that it will take about a hundred years before he can reasonably expect his farm to arrive at full production through cumulative, practical experience; but there are elements of probability in both these statements worthy of careful consideration by those who are interested in the agricultural development of the Great Plains.

"On the other hand, investigations show that the average yields in the northern Great Plains, measured in terms of bushels of wheat per acre, are 16 bushels. If, however, the inhibiting factors, other than deficient annual precipitation, could be reduced to the same extent on the average throughout the entire period that they have been in some instances, these average yields would be over 30 bushels per acre. It is a fact that some of these inhibiting factors. such as hailstorms, hot winds and extreme drought at critical periods in the development of the crop, are entirely beyond the control of man. There are, nevertheless, many other factors, such as the loss of moisture from weed growth, faulty systems of tillage and crop sequence, poor seed, plant diseases, and insect pests that are more or less under man's control.

"It, therefore, seems reasonable to expect, that the average crop yields of the Great Plains may in time be increased by better farming practices from the equivalent of 16 bushels of wheat per acre to 20 bushels, or an increase of 25 per cent. When this time comes, and there is a real economic demand for increased agricultural production in the United States at prices that will yield the farmers fair profits on their investments of money, labor and managerial ability, the Great Plains will become one of the greatest food-producing regions of the world. In the meantime, the agriculture of the Great Plains should be allowed to develop naturally without artificial stimulation, and investigators and practical farmers now established in that region should continue to add as rapidly as possible to the store of agricultural knowledge that is absolutely essential to the ultimate development of the undeveloped agricultural resources of the Great Plains."

I would particularly direct attention to this outstanding fact, that the possible increases in yield per acre, foreshadowed by East and Chilcot, involve additional cost of production. They would be the fruits of intensive culture, which, with the present price basis of wheat, would not be a paying proposition for the farmer.

CHAPTER EIGHT

WHEAT PRODUCTION AND SOIL DEPLETION

There is an important cross-section of public opinion in Canada that regards wholesale wheat production on our prairies as a passing phase—a mere incident of pioneering conditions—which will gradually disappear as our farmers are educated to more intensive methods. It is taken for granted that diversified agriculture is destined to become the leading occupation of the western farmer. This public opinion is largely tolerant of the present situation, regarding it as a necessary evil, but to be changed as fast as circumstances permit. This view is quite plausible and is held not alone by the uninformed "man-on-the-street," but also by many leading economists and agricultural, educational authorities and thinkers. Its main basis is the theory of the rapid exhaustion of the soil under continuous grain cropping. This conception of the situation has the merit of being strictly in line with orthodox agricultural thought and experience the world over.

2

The subject referred to has the most intimate bearing on Canada's future. No one can "size up" or understand the West in the remotest degree without a clear perception of the issue here involved. I may also confess at the very outset, that my own conclusions are at variance with commonly accepted theories. I shall be considered bold—or perhaps foolish— to set my theories up against those of a large body of technical experts. Mine happen, however, to be founded on

incontrovertible facts. The agricultural chemist is still groping in the dark so far as soil investigation is concerned. The State of California has produced wheat on her semi-arid lands since 1866. Straight wheat and nothing else. No live stock is carried and nothing in the way of fertilizer, natural or artificial, is returned to the soil. In the State of Oregon wheat production also is the sole business of the interior farm. I shall show that there has been no perceptible diminution in yield per acre over fifty years of straight wheat farming in those States.

The following is a table of yields of wheat per acre from official sources:

Years.	1879	1889	1899	1909	1919	1926	1927	1928
Oregon	16.8	16.8	16.6	16.0	18.1	19.1	25.1	22.7
California	15.8	14.4	13.6	13.0	15.5	18.4	16.8	21.0

When one consul s the average for each ten-year period, the lesson is equally as conclusive. If anyone can find material here to sustain the theory of soils "wearing out" with continuous wheat cropping, I am open to argument. Crops have been grown for four thousand years on the semi-arid "loess" plains of Northern China, without resorting to artificial fertilization. We have yet a lot to learn about soil chemistry!

3

But it is not necessary to lean entirely on records from wheat growing States south of the line. In 1899, while Deputy Head of the old Territorial Department of Agriculture at Regina, a lease was taken by my department of a small area of land south of Calgary for irrigation demonstration purposes. The selection was attacked in the Legislative Assembly on the

grounds that this piece of land was "a worn-out sand and gravel bank, which had been cropped to death ever since 1865." The charge, on the face of it, was substantially correct. I determined to have comparative analyses made of the top-soil and sub-soil of this so-called "worn out" land and of the virgin prairie immediately adjoining. Soil samples were accordingly taken in a dozen representative spots and sent to the Dominion chemist at Ottawa for a quantitative analysis, which, by the way, is a laborious and lengthy process.

In the course of a couple of months a message was received asking whether by any change a mistake had been made in marking the four samples. My reply was, that I did not think so, but in order to make absolutely sure, I forwarded a second set of samples, which, as a precautionary measure, I had retained at Regina. The whole process was repeated and when the second analysis had been completed, I received a report from Dr. Shutt, the highly capable Dominion chemist, to the effect, that both analyses showed, that the so-called "worn out" land contained a greater amount of available plant food than the virgin prairie adjoining it. He pointed out, that as this result was absolutely contrary to everything we had taught in the past, it was highly inadvisable to give publicity thereto. In this I agreed, but a great many years have now passed, and new theories have been formulated on the subject, so there can be no harm in referring to the matter here.

The explanation is simple enough. The cradle of our soil research work was located in humid countries. Great Britain, Germany and afterwards the eastern parts of the United States. It had been common knowledge for centuries that soils there deteriorated to a

marked degree unless heavily manured or treated with commercial fertilizers. The conclusion was naturally drawn that each crop removed a specific amount of plant food from the soil, which had to be artificially replaced. The popular illustration used at farmers' meetings, and still is, was the bank account with its known deposit, from which no more could be withdrawn than was put in. It was apparently a perfectly obvious and sound conclusion, and was, to some extent, founded on facts. Our earlier soil work in Canada was naturally based on this theory, and, as regards soils in humid districts, much valuable progress has been made.

4

With the advent of farming and soil investigation in semi-arid areas, here and in the United States, these theories quite naturally were regarded as fundamental, until actual experience threw doubt upon them. It is, however, only during comparatively recent years that new theories have been approached. It is now asserted, that the deterioration of British and New England soils has not been due so much to continuous cropping, as to the fact, that heavy rainfalls dissolve and suspend the mineral salts of the soil, which are carried off into water courses and ultimately find their way into the ocean, being thus irretrievably lost.

The top-soils of semi-arid Western America, where there is very little "run off" from heavy rainfall, and within which our hard wheat area falls, contain a practically inexhaustible supply of mineral plant food. The amount removed by the crop is comparatively infinitesimal, and there is no leaching by continuous

rains. An extended series of investigations carried on in the United States showed that some 300 soils from arid and semi-arid districts contained on the average three times as much potash, thirteen times as much lime, six times as much magnesia, and three times as much nitrogen as other soils taken from more humid regions.

To maintain the soil mechanically, humus must, of course, be restored from time to time, but that presents no obstacle to practically continuous wheat farming. I trust, I have made it clear, that the soil problem of the sub-humid West is quite different from that of the humid East, and we may, I think, safely dismiss any fear of our hard wheat area "wearing out" under any system of intelligent husbandry.

5

On this subject, the following statement, referring to our prairie soils, by E. S. Hopkins, Dominion Field Husbandman, at Ottawa, is interesting:

"**There is no indication at the present time of a falling off in the yields of cereals due to a decline in the fertility of the soil.** Variations in yield take place from year to year, and even over a period of years, it is true, but the cause of this must be attributed to variations in precipitation, to the inroads of weeds, or to the presence of insect or fungous pests rather than to a lack of fertility. When it is remembered that variations of over one hundred per cent. may be found in some localities in the average, annual precipitation of one five-year period compared with another five-year period and as much as fifty per cent. in comparing ten-year periods, the comparison of yields must be made with caution. Rotations of crops give good promise of maintaining high yields. At Rothamstead, England, it was found that the average yield of wheat which had not received any manure or fertilizers for many years was, when grown continuously, 11.0 bushels per acre, when grown after fallow 16.9 bushels, and when grown in a four-year rotation, including clover, 24.8 bushels per acre. Such large increases as this from rotations will probably not be secured on the Prairie for some years, but they

indicate methods of farming which will maintain yields for many years. By following a suitable rotation, by using the best varieties, by effective conservation of moisture and by a thorough control of weeds, insects and fungous diseases, there is no reason to believe that the yields of cereals throughout most parts of the prairie will, for many years, suffer any decline."

Mr. Hopkins here points the way to a permanent agriculture in our prairie provinces, consistent with grain as the leading production and without resorting to the expensive process of artificial fertilization. This will all come in time. In the meanwhile, we are doing very well, and have no complaints in respect to average wheat yields. We have our problems of soil drifting in certain areas, in certain seasons, but improved agricultural practice, built on investigation and experience, is overcoming them one by one.

CHAPTER NINE

AGRICULTURAL MECHANIZATION

In the financial and industrial world the drift toward mergers for large scale production and distribution is very marked. This tendency is admittedly the direct result of economic conditions developed during the late war. The war created the principle of mass production, and resulted in the introduction of scientific principles in management, finance, sales and production. The improvement in technical process and increased cost of equipment required for mass production made necessary larger units for successful operation. The higher cost of distribution of the products of industries has resulted in mergers for sales through such new channels as the chain stores. During this period of marked change in industry the small, family-sized farm has endeavored to hold its own, with disastrous results in many cases.

Agriculture just now is passing through the same cycle that encompassed industry one hundred and fifty years ago. The establishment of the first factory in Derbyshire, England, in 1719 sounded the deathknell of the guild art in the world. Manufacturing was definitely taken from the home. The separation of industry from the home caused much suffering on the part of those concerned which is so ably depicted by Oliver Goldsmith in "The Deserted Village." Agriculture is now passing through a similar process, due to the adoption by the farmer of the tractor, the combine, the automobile and other mechanical devices.

It is the popularly accepted opinion, that mechanization in urban industry is the result of progressive

management ever striving for greater profits, and that the high wages of industrial workers in North America is due to mechanization. I doubt whether these theories are correct, and wonder whether we do not get "the cart before the horse" and mistake cause for effect. I would suggest, that mechanization is due to the high wages industry is compelled to pay its organized workers. Mechanization simply followed the ever-rising wages scale, which stimulated invention and forced industry to cut the man-power in production in sheer self-defence. This has undoubtedly been the history in agriculture and the conclusive proof of that assertion lies in the fact, that even to-day, mediaeval agricultural practices are still followed in nearly all countries where the scale of wages is very low, and in spite of the fact that labour-saving implements are easily available. The decision to displace man-power for machine power, with its enormous capital investment, is seldom a voluntary act. It is an act of self-preservation reluctantly committed. This natural unwillingness of the human being to make capital expenditure until it is forced upon him by circumstances renders the competition with low-wage countries more even for Canadian agriculture.

Mechanization of prairie agriculture is primarily the product of low-wage competition from abroad, and, to a lesser extent, high wages within the domestic industry. The element of man-hours is steadily dwindling in grain production on the prairie farm. Under virgin conditions, new and revolutionary ideas spread amazingly fast. Wheat growers in the west solved the problem of marginal lands and high cost of production quickly and easily. The key was mechanical power—tractors, one-way disk plows, wide grain drills,

combines and trucks, with as much land as the equipment could possibly cover. They applied the machine methods of the modern factory and cut human labor costs to almost nothing. It is the only known method for farming marginal land profitably. The important items in agricultural operation now are land and plant investment, and the attendant costs of taxation, maintenance and obsolescence. The operating problems fairly resemble those of urban industry.

2

Man, equipped only with a hoe, spade, sickle, and flail, has never yet commanded a very high honorarium. With this equipment, the great struggle in life must of necessity be to avoid famine and secure the bare necessities of existence. Moreover, the surplus over the securing of these things will not be great even though the standard of living of the worker is low. With this equipment, the proportion of the population required to provide sufficient farm produce to avert famine, must include the greater proportion of the male, adult population, a proportionately larger number of the females, and so much child labor that the training of youth is seriously interfered with, if not entirely precluded.

Canadian agriculture now has more power available for its use than any other branch of industry. It has more power available per worker than the combined manufacturing industries and uses more power annually than all of the mining industries. Such a development, most of it taking place within the past ten years, puts a new face on the entire future of agriculture. It is already bringing about marked changes in the agricultural map, particularly with reference to the size of the farm unit and shifts of crop acreage.

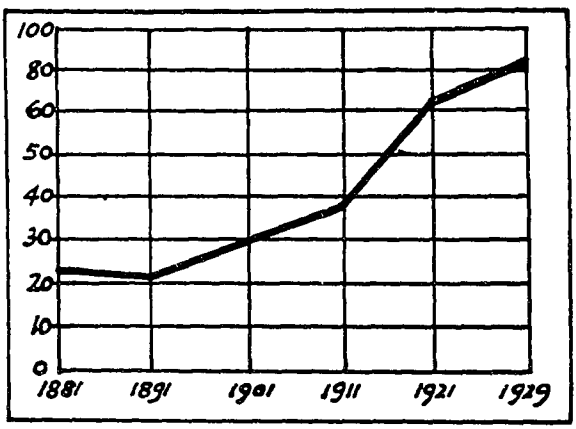
Since the introduction of the mechanical reaper in 1834, enormous strides have been made in mechanizing North American agriculture. Whereas the average number of acres tilled per worker for the years around about 1900 was, in Italy 4.7, in Belgium, 5.3, and in France, Germany, Hungary and the United Kingdom between 7.1 and 7.3, in the United States it was not less than 27.0. Similarly, taking the United States standard of productivity per worker as a base of 100, the Italian worker attains only an index number of 15, the Hungarian of 27, the French 31, the Belgian 40, the German 41, and the Englishman 43.

In 1911 the area under field crops in Canada was 35,261,338 acres and the total number of persons engaged in agriculture was 933,735; therefore, each person so engaged was, on an average calculation, responsible for the cultivation of 38 acres, and every 1,000 acres called for 26 workers. In Alberta, Manitoba and Saskatchewan the area under field crops was 17,677,091 acres and the number of persons engaged in agriculture was 283,472, so that each persons so engaged was responsible for 62 acres, while every 1,000 acres required only 16 persons. The 1926 census figures are even more striking. They indicate about 400,000 males gainfully employed in agriculture in the three prairie provinces and 35 million acres in field crops. This makes a per capita area of 87 acres, and every thousand acres requiring a working force of only a fraction over eleven men.

In the United States in 1920, with only 68 per cent. of the human labour applied per acre that was applied fifty years ago, there was, nevertheless, an increase of production per acre of 35 per cent. The same facts regarded from another point of view are equally

striking; in 1870, of every 100 workers in the United States, 47 were required to produce the bare necessities of life, leaving only 53 available for other work. In 1920, only 26 out of every 100 workers were required to produce the prime necessities, leaving 74 available for other work.

ACREAGE CROPPED PER WORKER IN PRAIRIE PROVINCES



3

The combine harvester has within the past couple of years displaced over 25,000 men on our western farms with a consequent lowering of production cost. It has been estimated that we can produce a 25-bushel-per-acre crop for 43c. per bushel. With the use of the combine, this cost can be cut to 25c.

The director of the government experimental farms estimated there were in 1928 3,657 combines operating in the Prairie Provinces and the Saskatchewan government labor bureau places the figure at 3,917, of which 2,679 were in Saskatchewan, 1,067 in Alberta, and

171 in Manitoba. The bureau estimates that there were at least 4,000 in operation in the Province of Saskatchewan alone during 1929.

The saving of labour is not the only economy gained by combine harvesting. It has been a common belief that cutting wheat with a binder when in the dough stage and allowing the grain to dry in the bundles, gave just as high a yield as allowing it to get fully ripe before cutting. This is probably true, for the shattering in binding, and hauling will be much greater on ripe wheat than on green wheat. This extra loss from shattering probably offsets the greater yields, which tests show are obtained by allowing the wheat to ripen on the standing stalk instead of in the bundles. Repeated tests have shown, that where the yield of wheat at the time cutting would ordinarily be started with the binder is, say, 36 bushels per acre, the yield will be about 3 bushels greater ten days later when the combine could be started. The yield will then remain stationary for several days and then start declining very gradually, due to shattering, until, about two weeks later (almost a month after cutting could be started with the binder), it will again be back to 36 bushels.

Obviously, there is considerable risk in permitting the grain to become fully ripe on the stalk in Western Canada in ordinary seasons, but we may look forward to the development of strains of wheat adapted to combine harvesting. This will be a most important field of investigation, which doubtless will not be neglected.

The "combine" method of harvesting grain is not, of course, a new idea. It has been used for half a century in the wheat fields of California, Washington and Oregon. In these states, however, winter wheat,

with a strong straw and non-shelling heads, predominates, and the hazard of early snow storms does not exist. The new idea is merely to adapt the combine to districts where these favourable conditions are not present, or are only partly present. Experimentation with combine harvesting now covers the whole world.

It is interesting to speculate as to the reasons for this sudden spread of a machine which had been in use for so many years. Possibly two very different causes are responsible: First, the development of the internal combustion engine to its present degree of reliability and the fitting of it to the combine as an independent source of power. This, by ensuring that the threshing part of the mechanism is run at a constant speed, regardless of the speed at which the cutting mechanism is driven through the crop, goes a long way towards giving good threshing. While the speed of the thresher varied with every change of the travelling speed a good sample of threshed grain was impossible except on level plains. Secondly, there is the adoption of later cutting. If the built-in gasoline engine is the secret of the mechanical success of the combine, the adoption of later cutting is the secret of its successful practice.

The Institute for Research in Agricultural Engineering of the University of Oxford, England, after extensive trials, reports as follows:

"The combine is a practical means of harvesting grain in this country. The climate is not a bar to its use, and its adoption should be seriously considered by large grain growers, Where straw is required for sale, and is an important part of the crop, the use of the combine cannot be recommended: Means of drying the grain must be regarded as a necessary part of the combine harvesting plant."

Grain driers have now been perfected in England, and it is significant that this additional handling expense is considered feasible in order to take advantage of the saving of labour in harvesting, even in a country where the labour cost is so low. Trials have also been made of combine harvesting in Germany, Sweden and many other European countries with very favourable results.

The United States Secretary of Agriculture in addressing the Country Life Conference, in the course of his speech, said:

"Contemplate, for one instance, the combine. This invention has revolutionized wheat farming, brought vast acres into cultivation, reduced the labor costs of production and precipitated the wheat crop of America into the market in a vast ungovernable torrent which has choked elevators, filled thousands of railway cars, embargoed ports, and well nigh broken down the marketing machinery of the country. So far from being static, agriculture has accepted the findings of biologists, adapted the discoveries of inventors, and kept pace with progress."

It is perhaps too early to predict the complete success of the combine in all sections of the West and under all weather conditions, but there cannot be the least doubt that the introduction of this labour-saving implement marks a new era in western agriculture. It is being improved rapidly and with it agricultural practices, which may in the end have to be changed considerably to conform with any limitations of the combine that inventive skill cannot remove. Its cost saving possibilities are so great that any reasonable departure from established practices is well worth while.

The successful development of great areas of marginal lands in our west will be one effect of the introduction of the combine harvester, This implement is particularly useful on the drier areas and will

enable the farmer to "make the grade" on a surprisingly low yield. We may safely conclude that the combine will be largely responsible for a very considerable addition to our western wheat acreage within the coming decade. It will also give impetus to the present tendency towards larger farms, which, in my opinion, will be an economic gain in the end. It is not overstating the case to assert that the arrival of the combine harvester is the most revolutionary incident in agricultural history since the invention of the reaper.

4

The evolution of agriculture in modern times affords an interesting study. The farm was designed originally to be a small, self-supporting unit wherein the farmer produced all he consumed and consumed virtually all he produced. It was an attempt to set up a new type of civilization wherein the farmer fitted as a self-supporting member. It was a new way of living, or, in reality, a mode of life. But changing conditions have vitally interfered with this idealistic program and we must now face stubborn facts. The farm is no longer self-supporting. The farmer needs tractors instead of horses. He goes to town in an automobile instead of the old, one-horse surrey. He cannot feed hay to the tractor or automobile. In a word, the farmer now buys and sells. He is a business man, and his farm must be conducted as a business unit or fail. During colonial days, 93 per cent. of the population of America lived on the land. To-day no more than 27 per cent. of the people of North America are farm dwellers. The early day farmer was not so much interested in producing crops for sale, as he was in building up a self-sustaining institution. He

raised wheat, not to sell primarily, but to take to the mill to be ground, and to be returned to him for the use of his family. He raised wool, not to sell, but to be worked up into homespun. He raised coarse grains to feed his hogs and cattle, and he kept a cow or so for his own use. The farmer raised his own food, made his own clothes, churned his own butter, smoked his own meat. Fifty years has changed this picture completely. Agriculture has now definitely entered the industrial stage.

The great revolution in agricultural methods of the past 50 years will, however, look trifling, compared with that which will take place in the next 50 years. This great revolution will begin with the application of power to seed-bed preparation. Efficient soil-tilling machines which mix and pulverize soil, organic material and plant-food, will produce an ideal seed-bed. Under the present system of seed-bed preparation, two or three years often pass before all the organic material has decomposed sufficiently to release the plant-food it contains. The new soil-tilling machines will break up stalks, stubble or manure into particles so fine that decomposition will take place quickly, and the plant-food will be made available the same year.

One of the greatest menaces to successful agriculture in the plains regions of America, has been the prevalence of weeds. The amount of loss caused by weed growth is staggering. New methods of weed control, made possible by the application of mechanical power, will, in time, give us fields which are practically free from weeds. These improvements might conceivably bring about a very substantial increase in the yields of the principal crops.

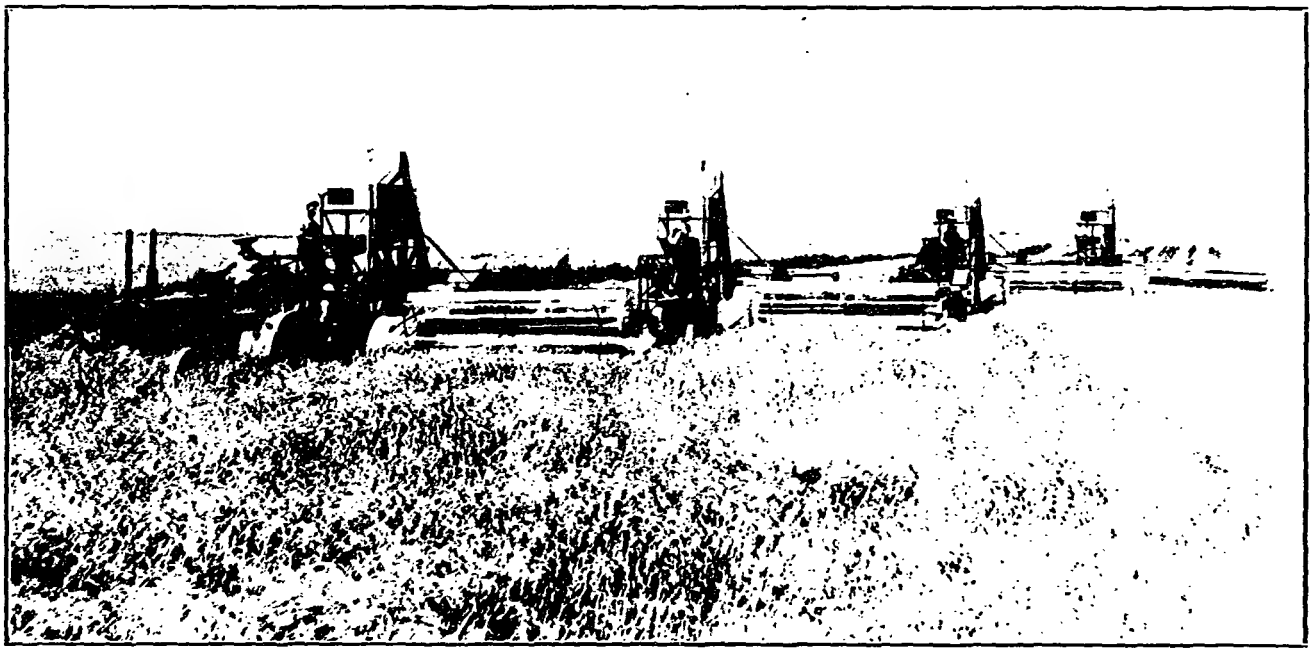
To keep fields free from weeds, two surprisingly simple principles may be followed. Machines especially designed for the purpose can be used to collect all weed seed naturally found on the surface of the ground. This seed can then be disposed of. Such an operation, which would eliminate the entire stock of weed seed, should not often be necessary. The second principle will be to "cultivate" the weeds so roughly that their roots will be injured beyond the possibility of any further growth. For years, agriculture has been hampered by traditional methods of cultivation. Some of our methods of handling weeds are little more than transplanting methods. Yet, we have used them for many years. The new cultivator will so tear and batter weeds that after one experience of this manhandling they will be destroyed for all time.

The universal and successful use of mechanical traction power, has also enormously reduced the agricultural wages bill. We do not perhaps sufficiently appreciate the significance of power machinery in modern wheat farming. The following table throws some light on this subject:

Method of farming	Acres of wheat per 1,000 hours.
Man power	3 1-3
One horse	10
Two horses	25
Four horses	66
Five horses	111
Power machinery	333

This indicates clearly that mechanization on the farm has made strides easily comparable with the mechanical advance in industry generally.

Specialized implements of all sorts are coming into common use and are cutting the cost of production at a tremendous rate. This excursion into the field



Four 12-foot Gleaner Baldwin Combines pulled by two tractors, operated by 4 men—cut and threshed an entire quarter section of wheat on the Harry Massoni ranch, near Kismet, Kansas, July 3, 1929. The Combines were hooked up with a Gleaner Baldwin tandem hitch and one medium-sized tractor pulled the 2 machines. The tractor operator operated the front Combine from the tractor seat. The wheat made about 20 bushels.

of mechanization has been expensive, and in many cases perhaps injudicious, but our wheat growers, in their anxiety to cut cost and increase production, may be pardoned for a desire to equip themselves properly even at the risk of incurring financial embarrassment in unfavourable seasons.

5

We should take into consideration the net result of this policy, and the advantage that has accrued to Canada by reason of the increased production thus rendered possible. The extent of this has had a considerable bearing on the general, national prosperity during the past decade. The following census statistics show a comparison between 1911 and 1926:

Census of 1911.

	Rural Population	Occupied Farms	Area Under Wheat	Wheat Production
Manitoba	261,029	43,631	2,760,371	34,125,900
Saskatchewan	361,037	95,013	4,228,200	66,978,996
Alberta	236,633	60,559	879,301	9,060,210
Totals	858,699	199,203	7,867,872	110,165,106

Census of 1926

Manitoba	360,801	53,251	2,285,858	51,077,000
Saskatchewan	578,476	117,781	13,496,457	218,643,000
Alberta	374,614	77,130	6,114,418	113,120,000
Totals	1,313,951	248,162	21,896,713	383,440,000

It will be observed that rural population increased by about 54%, but area under wheat increased by nearly 200%, and the crop in even a greater proportion. Since then the increase in the western area under wheat (23 million acres in 1928) has been even more

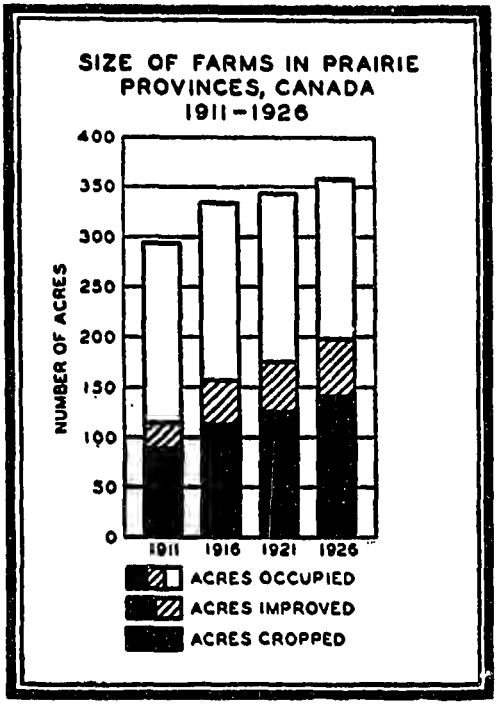
remarkable. In spite of an almost stationary, rural population between the years 1921 and 1926, the increase being only 61,000, the area under wheat increased in the three provinces from 16,841,000 acres to 21,896,713, being at the rate of 33%, as against only about 5% increase in rural population. This is a very significant development and shows the increasing productive power per capita, resulting also in increasing purchasing power.

A comparison between occupied farms and cultivated area of 1921 and 1926 shows in a very striking manner the effect of mechanization on prairie farms. The general tendency at present is evidently towards a decrease in the number of occupied farms and an increase in the area under cultivation. The following are the census figures:

	1921		1926	
	No. of Farms.	Cultivated Acres.	No. of Farms.	Cultivated Acres.
Alberta	82,954	11,768,042	77,130	13,204,114
Saskatchewan	119,451	25,037,401	117,781	27,714,490
Manitoba	53,252	8,057,823	53,251	8,346,021
Totals	255,657	44,863,266	248,162	49,264,625

It will be noticed that the number of occupied farms decreased by 7,495 in the five-year period, whereas the area under cultivation increased by 4,401,-359 acres. The improved area per farm was increased by 26 acres in Saskatchewan and by 30 acres in Alberta. This indicates a very rapid reorganization in western agriculture.

Farm mechanization on the enormous scale that we are now witnessing must, of necessity, have far-reaching economic and social consequences. These



obviously will be more conspicuous in countries of large farms, where machinery can be most advantageously utilized. While the dwindling number of occupied farms on our prairies, revealed by the census, may come as a shock to many, there is consolation in the fact, that the smaller the proportion of the population engaged in agriculture, the more economically will farm commodities be produced, other things being equal, and the greater will be the prosperity of the individual farmer. The reorganization of agriculture, which has been the outstanding phenomena of the past decade, has proceeded along sound lines, and is clearly in the direction of greater efficiency and improved social welfare. There does not appear to be the least cause for alarm.


ATLANTIC OCEAN
CANADIAN SHIELD
LAURENTIAN UPLAND
APPALACHIAN
WINNIPEG
REGINA
EDMONTON
PEACE RIVER BLOCK
GREAT INTERIOR PLAIN
ARCTIC OCEAN
PACIFIC HIGHLAND
ALASKA
PACIFIC OCEAN

CHAPTER TEN

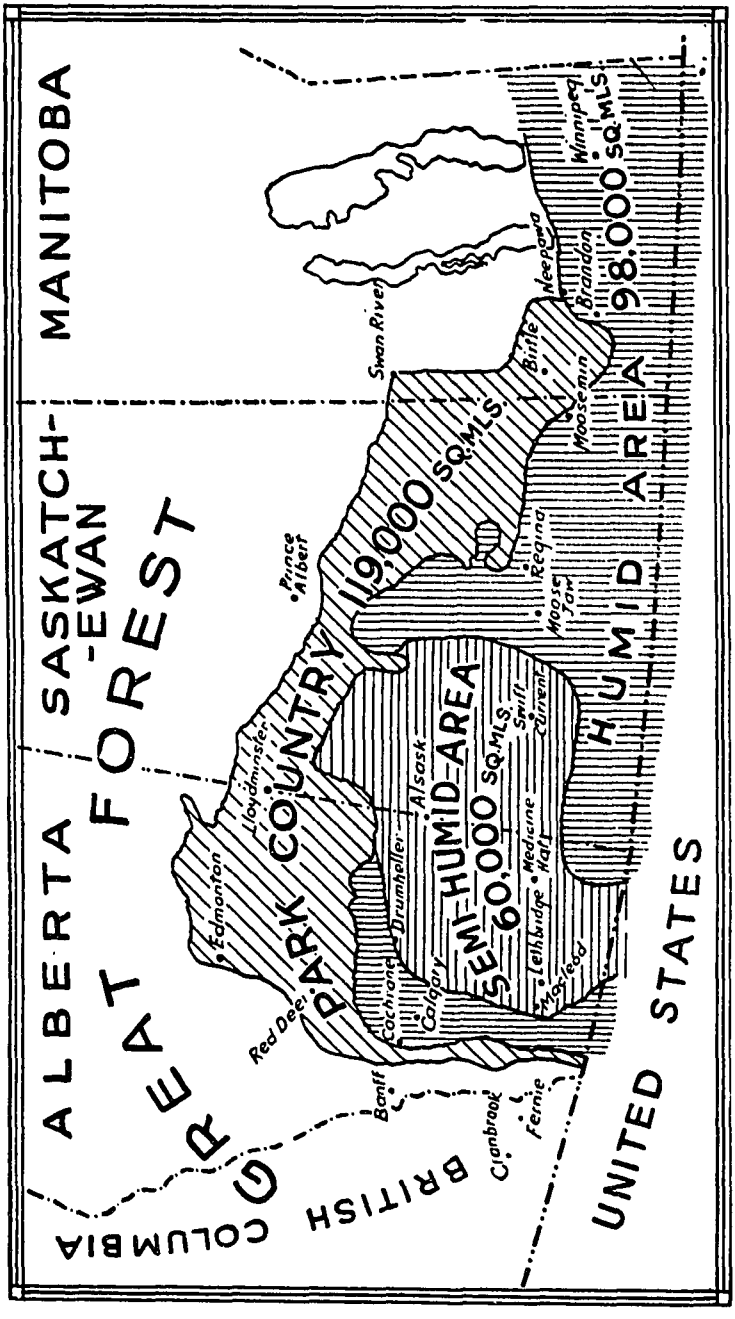
AGRICULTURAL CANADA

The great agricultural area of North America is contained within a huge triangle with the base resting on the Gulf of Mexico and the apex on the Arctic Ocean. The top of this triangle within the Dominion of Canada, rests on the International Boundary, between Winnipeg and Pincher Creek, and the apex on the north-easterly boundary of the Yukon. East of this agricultural area lies the great Laurentian Plateau and west of it the Rockies. Within this arable triangle, commonly called the "Great Interior Plain," lies one-quarter of the Province of Manitoba, a little better than half of Saskatchewan, three-quarters of Alberta, one-fifth of British Columbia and a small fraction of Ontario and Quebec. This, by and large, is agricultural Canada.

South of the Great Canadian Forest, which is not arable, we have, in the three prairie provinces, the following divisions of land:

Park Country	119,000 sq. miles
Humid Plains	98,000 sq. miles
Semi-humid Plains	60,000 sq. miles
Total	277,000 sq. miles

Reduced to acres we have in the West 177 million acres of arable land, 39 million of which are under cultivation. 38 million acres of the total arable land fall within the semi-humid area, which constitutes almost one-fourth of all western arable lands and almost one-half of all arable lands in Alberta.



MAP OF WESTERN WHEAT AREAS.

CHAPTER ELEVEN

THE LEAN AND THE FAT SEASONS

The great bulk of the semi-humid area has an average, annual rainfall of 13 to 14 inches. Parts of it has 15 inches, and a very insignificant part 11 to 12 inches. This, it will be observed, reveals a situation which apparently is very far removed from typical arid conditions such as prevail in the dry districts south of the line. In fact, we may, with perfect propriety, quite conservatively describe it as an agricultural country with limited rainfall and subject to years of local inadequate precipitation.

It is important to get clearly into our minds the very significant fact, that this sub-humid area is the "quality wheat" area. No. 1 Northern, the highest grade of export wheat, is not produced in quantity north and east of a line running from Olds to Saskatoon, thence to Regina and Brandon. Furthermore, the highest proportion of high-grade wheat, with the highest protein content, is undoubtedly now the product of the drier area. The sub-humid section has a growing season of 130 to 150 days as compared with 120 to 130 in the more humid areas of the West.

It is important to grasp the idea, that wheat is essentially a plant which reaches its highest state of perfection with an effective, minimum rainfall. It is in the sub-humid portions of the globe that wheat figures as the staple crop. In the humid areas it becomes soft and merely occupies a place in the ordinary scheme of crop rotation.

2

Drouth is the arch enemy of the wheat grower the world over. Our prairie section forms no exception to this rule. We may, therefore, at once lay down the general proposition, that the wheat producing possibilities of any agricultural district may be determined by its rainfall over a sufficient period of years to establish a reliable record. We have available statistics of rainfall at the Calgary meteorological station as far back as exact records have been kept by paid observers. I have myself added the statistics for 1884, from information I have obtained from reliable sources in order to establish a forty-five-year period.

The Calgary district is by no means the driest in the West, neither has it the reputation for any outstanding agricultural advantages. It is probably as near the average between the driest and most humid parts of the country as can be selected, and, therefore, constitutes a fair standard. The West is a country of magnificent distances and as rainfall is always very local in extent, it would be idle to assert that the lesson of that district can be indiscriminately applied everywhere else without fail. But it is, nevertheless, a fact, that the general trend of rainfall throughout the entire area covered by the three prairie provinces, is approximately uniform. Either the season inclines to be wet, or it inclines to be dry all over, with sections here and there which receive more or less than the average rainfall.

The greatest possible significance attaches to forecasting the probable occurrences of dry seasons in the West. These periods practically furnish the key to the cycles of depression and prosperity throughout

Canada. It is difficult to establish, from the information available, any definite cycle of dry and wet years. The nearest we can come to it is by comparing the period, 1889 to 1894 with the period 1917 to 1922 inclusive. These periods represent two cycles of six years each, which were the driest in the past forty-five years of the agricultural record of that particular district.

But the most encouraging lesson we learn from these statistics is, that between these two dry spells, came a period covering twenty-two years of uniformly, ample moisture conditions, with the exception of 1909 and 1910, which were exceedingly dry, and with the possible exception of 1895-96, for which we have no crop yield statistics available. But I farmed in the Calgary district myself during the latter two years, and my recollections is, that the yields were quite above the average. Following the dry season of 1922, we had six years of extraordinarily favourable crops, interrupted by 1929. My conviction is, that few countries can show a more satisfactory record than this.

It is true that we had some very low crop yields in years of apparently ample rainfall. This should not be taken too seriously. It is only during the past dozen years that any attempt has been made to farm properly in the sub-humid parts of the West. A new agricultural technique has been gradually developed, based on experience and research, but the momentous task of impressing upon the mind of the scattered farming population the importance of adopting these improved practices in dry land culture, has made comparatively slow progress. The reason for this disappointing advance in sound, agricultural

practise, may be ascribed to our large preponderance of favourable seasons, when results from stubble crops and a somewhat sketchy system of culture, are frequently equally as good as from well prepared land. The lessons from the odd dry years are, unfortunately, quickly forgotten in long runs of favourable seasons. This very human attitude of mind is quite characteristic of new countries. There is, however, an observable improvement each year, which has an important bearing on aggregate crop results. The process of cultural reformation apparently cannot be considerably accelerated. Experience is the only effective, though expensive, teacher.

My own observation is, that a rainfall of anything over ten inches prior to the end of August may give excellent results. We enjoyed this minimum during thirty years out of the forty-five. The remaining fifteen years were by no means all seasons of crop failures. In 1917 and 1920, for example, this district showed yields of 25½ and 23¼ bushels per acre on a little more than eight inches of recorded rain. The distribution of the rainfall over the growing season is a factor of very great importance in the final crop result.

3

To summarize the situation, let me point out, that with the year 1888 a lengthy period of highly favourable agricultural years evidently came to a close. Early settlers agree that such was the case in the Calgary district, but there is no authentic information available as to how long this period was. In Manitoba, records of grain yields per acre go back to 1883, and the Department of Agriculture reports the following yields of wheat per acre: 21.8 in 1883, 20.1 in 1884, 20.8 in

1885, 15.3 in 1886, and 25.7 in 1887. There is no record for 1888. We find then that "lean" seasons commenced in the Calgary district with 1889, and lasted for six years, although 1890 was a fairly good year. In 1895, good seasons were ushered in and lasted, with a few interruptions, for twenty-two years ending in 1916. Then followed the six driest years in history, ending with 1922, but the period 1922 to 1928, inclusive, were amongst the most favourable in our brief agricultural history.

It is not possible to establish any periodic cycles of favourable and unfavourable years in the West on the basis of present information. Our forty-five years' experience shows that the West is subject to occasional, or possibly periodic, runs of dry seasons. They do not necessarily cover the entire West in every instance, but they constitute a climatic handicap which cannot be ignored. We also find, that this particular kind of calamity has in the past occurred only during six years out of every twenty-eight year period. Drawing comparisons with other agricultural countries, wet or dry, I have no hesitation in expressing the conviction, that it will be difficult to find any country with a more favourable record. Neither should we over-look the fact, that in humid countries crops are destroyed, or partly destroyed, by excessive moisture much more frequently than adverse seasons are encountered throughout our prairie sections owing to drouth.

CHAPTER TWELVE

DIVERSIFICATION vs. SPECIALIZATION

We frequently hear disquieting remarks in respect to the drift of western agriculture. The western grain grower is popularly pictured as a "soil robber," interested only in the present and oblivious to the penalty of soil exhaustion, which must inevitably face him in the near future. Western prosperity is built *par excellence* on grain production, but we are told that this is an unscientific system of farming and that our only salvation lies in adopting intensive and diversified methods in western agriculture. The proper utilization of land, being the most important element in farm economics, this whole controversy touches intimately the very foundation of our agricultural structure.

There is so much misinformation and loose thinking on this subject that it would be well to attempt to clear the atmosphere. Because, if western agriculture is pursuing uneconomic policies, it is important that Canadian business interests should know it to enable them to forecast the future trend of their western market. Sales, credit and expansion policies of industry, commerce and transportation must necessarily be profoundly influenced by the question of whether the prairie section is developing along economically sound lines, whether its system of agriculture is on a permanent basis or is built on the easy exploitation of virgin soils, with a day of reckoning looming up in the near future. It is my deliberate judgment, that without an intelligent understanding of the economics involved

in this situation, the Canadian business man cannot hope to interpret or forecast correctly either the present or the future picture of Canada.

2

The "hardy perennial" in public opinion in respect to what the western farm should do is the criticism that he has "all his eggs in the one basket," and the belief that he ought to diversify his operations and embrace intensive farming. It seems to me that there is a complete misapprehension in the popular mind of the whole meaning and philosophy of intensive, diversified farming. History teaches unmistakably that intensive farming is primarily the product of pressure of population, creating increasing land values, leading in turn to smaller farms and to the economic necessity of expending more labour on smaller areas in order to *make a living*.

Diversified farming is not developed by any national ambition to increase export production, and is not necessarily to be regarded as a higher form of agriculture, or as a final stage in the evolution of that art from its simple, pastoral beginning. The art or skill required in connection with the efficient, specialized, extensively operated farm is, at least, of just as high an order. Intensive farming is an economic necessity in countries such as Italy with .98, and Belgium with .57 of tilled acres per capita. It has no place on a large scale in Western Canada with 18.5 tilled acres per capita, and with this figure rapidly increasing year by year instead of diminishing as in Europe. We want better farming, but not necessarily intensive, diversified farming.

I am not, of course, trying to argue that an attempt should not be made, within reasonable limits, to produce on our specialized farms as many as possible of the ordinary foodstuffs required on such farms. This, it goes without saying, is being done on most well conducted farming enterprises, as far as circumstances permit. It all comes down to the most profitable utilization of expensive labour. It is, however, quite conceivable that butter can be bought on the market cheaper than it can be produced on many specialized wheat farms, which are not organized for dairy production. The purchase of butter in such cases is not an evidence of slovenly farming, but rather of superior business administration. These are facts which must be taken cognizance of in passing judgment on western farming methods which, I maintain, are, by and large, as efficient as those of any country in the world, basing comparisons not alone on the conclusive test of net earnings, but also on the effective use of man-power.

3

This is essentially an age of specialization. Industry has been brought to its present high state of efficiency by specializing on one, or a few, products. This has rendered possible the cult of mass production with all its startling economies. No one has yet been able to show that the production problem in farming differs in any respect from that of industry. The principles that govern successful industry apparently apply with equal force and effect to the business of farming. The farmer in a high-wage country must be equipped with all the latest labour-saving devices available. His goal must be the highest per capita

output. Otherwise, he cannot meet the fierce competition that faces him from countries where the labour item is an inconsiderable factor in the production cost. I need mention only India, the Argentine, Russia and certain European countries. Our farmer faces white, black and yellow competition in the world's market. This is a fact he can never afford to forget for a moment. The safety factor is mechanization and mass-production. The free use of machinery to save time has solved the problem of costs for manufacturers, but in farming the mere saving of time will not automatically increase net returns unless the farm is reorganized to utilize the time saved. Right there is the difficulty—how shall it be reorganized? Self-appointed farm advisers recklessly say "diversify." But hard-headed farmers know diversification has definite limitations.

And a moment's thought should convince anyone that our western farmer cannot possibly equip himself properly in every line of agricultural production. The capital outlay would be absolutely prohibitive. And any farmer who attempts to produce in any line of agriculture without proper equipment, will face a return on his capital and labour, which will reduce him to a state of peasantry. Furthermore, a very high degree of skill is involved in every branch of agriculture, as well as a wide fund of information. Why should we demand of our farmers an intellectual equipment and range of skill quite beyond the average human being?

If I read the tendency of the times right, the day of very small holdings in new countries is coming to a close. The grain grower must cultivate enough land to justify the use of a complete equipment with its large capital outlay. The dairy farmers must face

investment in cream separators, milking machines, feed carriers and all the rest of it, and so on all along the line. The logical drift in western agriculture is towards specialization and away from diversification. Machine farming compels specialization, because no one can afford complete equipment for several kinds of farming. The need for continuous productive operation of the farm, on the other hand, requires some degree of diversification. How to harmonize these two antagonistic principles is the most difficult problem in agricultural economics.

4

The late Henry Wallace, in his "Our Debt and Duty to the Farmer," says:

"The financial loss of farmers in the Middle West is more fully portrayed in a survey made in 1923 by the Department of Agriculture. This survey shows that about 8½ per cent. of the owners of farms in fifteen States of that region lost their farms between January, 1920, and March, 1923. In addition, another 14½ per cent. of the farm owners were in fact insolvent,but retained possession of their farms through the leniency of creditors. Tenant farmers fared even worse. About 14½ per cent. of the tenants lost their property, and another 20 per cent. were hanging on merely because their creditors were willing that they should."

This refers to the most diversified and intensively cultivated area of the United States. That system of farming apparently led to vastly more disastrous results during the trying post-war period than we experienced on our prairies under our extensive agriculture. The undisputable and proven fact is, that extensive farming invariably pays better than diversified operations. Economically, a sparsely settled country is more prosperous with extensive than intensive agriculture. Let us also get this fact in our minds, that, as a purely economic proposition, an acre of wheat

produces more human food, with less labour cost, than an acre of any other product.

On this continent we have cotton belts, citrous fruit belts, apple belts, corn belts, wheat belts, etc. They are there because of soil, climate, transportation facilities and markets. Nature, not man, is the dictator. The world's hard wheat area is extremely limited, so much so, that we almost control a monopoly.

5

Furthermore, we cannot ignore the fact that the basis of all productive industry, whether it be in the factory or on the farm, is profitable markets. If we could, by waving a wand, transform our prairie section into a huge, diversified farming unit, we would, at the same time, undoubtedly reduce prairie farming to abject bankruptcy. The volume of animal products would attain enormous proportions. Our narrow domestic market would be utterly swamped with such products as milk, butter, eggs and meat, leading to a complete demoralization of prices and forced exports to unprofitable overseas markets. Our farmers would, it is true, live on the "fat of the land" but they would have no money!

Diversification is proceeding as fast as economically feasible and advisable, and as fast as our markets for animal products develop, and this development, by the way, has been very slow and very disappointing to the western farmer. I have no hesitation in making this positive statement, that in spite of minor criticism that may justly be levied against our western agricultural policies and performances, farming to-day in our three prairie provinces, taking into consideration

the market situation and our local conditions and handicaps, is as remunerative and efficient as the world ever saw in any country.

From a standpoint of soil and climate, the Almighty evidently intended Canada to grow wheat on a large scale, and it is never safe to set ourselves in defiance of natural conditions. In 1924, the gross farm income of the West was $636 Mill. In 1925, nearly $900 Mill. 1926, $766 Mill. 1927, $776 Mill. This means a spending power per farm ranging from $3,000 to almost $4,000. It is interesting to note here that the gross income from farms in the U. S. for the same period ranged only from $1,750 to $1,950, or 50% below that of our three prairie provinces. That is efficiency. It would be well if we would clearly realize that our West is a vast country—a veritable inland empire—great areas are devoted to dairying and mixed farming, to hay production, to wheat and coarse grains. We are following the lines of least resistance and adapting our operations to local and world market conditions. Those who understand the situation are convinced, that we are pursuing the wise and proper course, and that there is no just cause for apprehension or serious criticism in respect to western agriculture.

CHAPTER THIRTEEN

CANADA'S POTENTIAL WHEAT PRODUCTION

The significant point to consider is the status of the prairie provinces as a wheat producer, and our ability to compete with low-wage countries. We cannot abandon wholesale, large-scale wheat growing and turn to other systems of farming over-night in sympathy with prevailing unsatisfactory wheat prices. Agriculturally, it is our main business. Furthermore, it is Canada's main business. Necessity, however, is the mother of invention, and the history of the West has been, that she has always quickly adapted herself to new situations. It is certain that Europe cannot compete with Canada in the growing of wheat. We also have the report to the President by the late Secretary of Agriculture, Wallace, demonstrating conclusively that the Canadian cost is substantially below that of our neighbors to the south. In point of quality neither Australia nor the Argentine can compete with us. Other countries are hardly worth considering. We are forced to the conclusion that Western Canada by virtue of "survival of the fittest" will retain her present predominating position, and will also become an ever larger factor in world wheat. The system of extensive agriculture on our prairies is without a doubt the most efficient the world ever saw. Our prairie farms represent 0.17% of all the farms in the world. These farms produced a round 10% of the world's wheat, or sixty times the average world production.

2

It is a fact of great significance, that Canada is the only country in the world where the wheat area may be increased substantially without resorting to the wholesale development of marginal lands, or the substitution of wheat for other crops. We have abundant, undeveloped acreage within present occupied farms, located in areas of sufficient, average precipitation, to maintain the present rate of increase for many years to come. The last census shows occupied land in the prairie provinces at 88 million acres, and the total area under field crops of 37 million acres. This gives us approximately 50 million acres of undeveloped, occupied land. If even 25 per cent. of these lands are arable and available, it would render possible an increase in wheat area of 12 million acres, equal to 50 per cent. of the present, total area under wheat. However, long before these lands are exhausted, reduced cost of production will render profitable the development of millions of acres of land hitherto considered marginal on account of insufficient precipitation in most years. The introduction of the combine has now, as previously mentioned, brought the development of such lands into the realm of practical possibility. An average crop of ten bushels to the acre is becoming a feasible business proposition on a reasonably large scale.

It is, therefore, abundantly evident, that no matter what may be the economic future of world wheat production, Canada will be the largest factor in the export market for generations to come. Hon. Thos. Crerar, president of the United Grain Growers, Ltd., recently offered the opinion, that Canada will presently produce a billion bushels of wheat and find a market

for it. All the facts of the case will amply support this prediction. Our total land area in the three prairie provinces is 466 million acres, of which 215 million is estimated to be arable. 88 million acres is now occupied and wheat is grown on 24 million acres. We cannot overlook the fact that the present occupied land is the cream of it, but, making all proper allowances, to estimate our outside, potential wheat production at a billion bushels is to err on the side of conservatism.

Our average, western yield per acre in 1915 was 27.3 bushels. To produce a two-billion bushel crop with such a yield, would require less than 75 million acres or a little over three times the present area under wheat. That we have the land to give us such a stupendous result in a year of high yield, cannot for a moment be questioned. In fact, at our rate of expansion in wheat production between 1911 and 1928, which was 31 million bushels per annum, we would reach the two-million-bushel mark in fifty years.

Thinking people would not, however, desire to see this possible development unduly accelerated. The growth in our wheat production now is about as rapid as the markets of the world seem able to take care of comfortably. In years of abnormal production, such as those we have recently passed through, we even touch the danger line. However, should our production at any time temporarily outstrip world demand, there is this consoling thought, that, owing to our low cost basis, the prairie farmer of Canada would suffer vastly less than his competitors, who would simply be forced out of the picture until the price level came within their cost of production. At the same time, if the calculation is correct that world wheat consumption now increases by one and a half per cent. per annum,

which would be about 60 million bushels, there would seem to be ample margin for taking care of Canada's comparatively modest 31 million-bushel annual increase. However, long-range predictions are quite meaningless. The point I want to make is, that out wheat-producing potentialities are to all practical purposes boundless. The only limiting factor is the price.

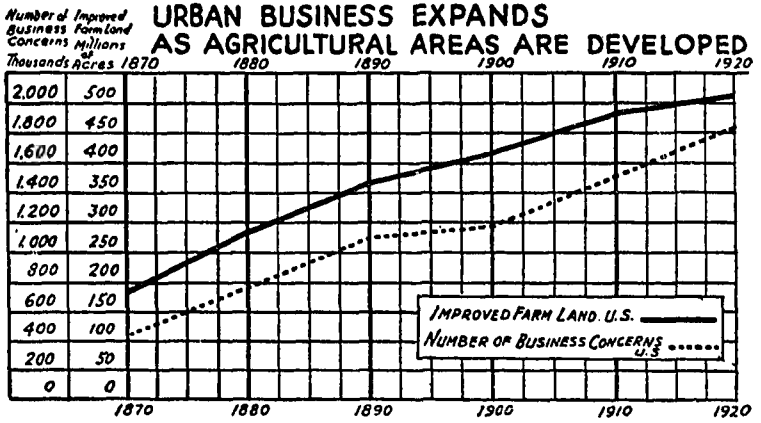
CHAPTER FOURTEEN

A QUARTER CENTURY RECORD OF PERFORMANCE

The average person readily gives intellectual assent to the time-worn phrase, that agriculture is the "backbone of the nation," but usually without positive conviction or any adequate conception of the fundamental facts of the case. It is generally a mere figure of speech. It is, therefore, well to consider briefly to what extent agriculture has been responsible for Canada's material progress. Forty-one per cent. of our net production in the last census year was agricultural; thirty-three per cent. manufacturing. Our forests, mines, fisheries, construction, etc., account for the remaining twenty-six per cent. Our 8 billions of agricultural capital represents 29 per cent. of Canada's total available wealth. Urban real estate accounts for 26 per cent.; our railway plants, 10 per cent.; forests, 5½ per cent.; mines, 2½ per cent., and manufacturing equipment. 2¾ per cent.

The following graph shows the expansion of urban business in the United States in comparison with the development of agriculture there, over a period of fifty years. The almost parallell lines are very significant. They are not accidental. The relation of agriculture to our national welfare deserves passing notice. Not only do food products enter daily into every home, but all have to be transported on land or by water—in wagon, railroad car, or steamship—from the rural districts to every hamlet, town and city throughout the land. Being in bulk they require vast numbers of carrying vehicles to bear them from one part of the

country to another. When they reach their destination, many of the raw food products are finished or manufactured into high-grade goods, such as cheese, flour, cereal products, meats, canned fruits and vegetables, and a hundred other foods which furnish mankind with its daily bread in countless variety.



Besides the millions of farm workers directly engaged in producing, there are other millions earning their living by performing work connected with supplying the implements, tools, shoes, clothing, etc., for the farmer, with the manufacture of raw material originating on the farm and the distribution and transportation of such commodities. Who is bold enough to attempt correctly to estimate the economic importance of agriculture in a country like Canada? It is perhaps well within the mark to assert that at least 80 per cent. of Canada's total population, in every walk of life, depends absolutely on the farm, directly or indirectly.

It is, of course, a mistake to suppose that the purchasing power of the prairie farmer is governed entirely by the volume and price of wheat. The annual income

contains such other items as butter and cheese amounting to about 43 million dollars; wool, 1½ million; live stock, 47 million; poultry products, 20 million, and many other minor products of the farm. But field crops amounting in round figures to 675 million dollars in an average, fair year, is, nevertheless, the most important item on the list and wheat is par excellence the cash crop the farmer depends on.

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That western farmers, as a class, are more prosperous than they are in any other part of Canada, is generally conceded. For instance, in 1929 there were 18,922 farmers in Manitoba, Saskatchewan and Alberta that paid income taxes. Ontario produced only 253 tax-paying farmers; Quebec, 14, and the Maritime Provinces, 59; all told, 326 east of the prairies. The total agricultural revenue of that territory for 1927 was in the neighborhood of $800,000,000. Thus the sum of about $2,400 returned to every farm in the prairie provinces as the result of its operations that year. This is a stupendous average income per farm and cannot be duplicated in any other country in the world.

This situation also accounts for the extraordinary per capita wealth of the entire population west of Lake Superior. Statistics of per capita wealth should always be considered with reference to the time element and to the distribution over the population. Great Britain probably stands first in the world in point of per capita wealth, entirely by reason of the accumulations of centuries, handed down from generation to generation. This vast inherited wealth is, however, largely in the hands of comparatively few families. The out-standing points about Western Canada's large

per capita figures is the brief period within which it has been created, little more than one generation, and its general distribution. Exclusive of undeveloped natural resources, the total wealth of the West exceeds that of the Maritime Provinces and Quebec by $882,797,000. The wealth of Ontario is given at $9,500,755,000. This shows that over one-third of Canada's wealth lies west of the Great Lakes. The western provinces easily lead in per capita wealth. The figures for the various provinces of Canada in 1927 were as follows: British Columbia, $4,032; Alberta, $3,660; Saskatchewan, $3,586; Ontario, $3,000; Manitoba, $2,976; Quebec, $2,631; New Brunswick, $1,829; Prince Edward Island, $1,713; Nova Scotia, $1,578. The average per capita wealth of the United States is only $2,918.

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Whatever influence agriculture may have had upon the creation of wealth in the other provinces of Canada, it will readily be conceded that, directly and indirectly, the wealth of the three prairie provinces has been created almost solely out of the soil. It, therefore, follows that the agriculture of that section must have been profitable in an extraordinarily high degree. The reasons for this farm prosperity are easily apparent, and the deduction that profitable wheat production has been the foundation of it all, is inevitable.

There is only one infallible method of estimating the productive capacity of an agricultural country, namely, the actual result of farming operations over a sufficiently long period of years to establish a reliable average. We have available very complete and very

reliable data from the three prairie provinces since 1904. These figures, therefore, furnish a Western agricultural record of performance covering a period of twenty-five years. It should also be carefully noted, that this period includes the most disastrous dry cycle known in the last forty-odd years' history of the West. We may, therefore, safely take it for granted, that the last twenty-five crops represent a conservative, average production. In the table of crop yields herein will be found the average yields per acre of wheat. I have selected wheat as the standard, because it is the great cash crop of the West, and is, for many reasons, a fair index of general agricultural production in any season.

But the significance of a certain yield of wheat, per acre does not, quite naturally, strike the average uninitiated mind. I have, therefore, established comparisons between annual, average yields per acre in the three Western provinces and in the four great wheat-producing states to the south of us, namely, Kansas, Minnesota and North and South Dokota. The wealthy and prosperous states of Minnesota and Kansas, with their flourishing industries and great cities, are, I think, fair examples of great communities built on a basis of a thriving agriculture. All they stand for has been created from the soil almost exclusively. I show in the table the yield per acre which has accomplished all this. Just compare it with those of our prairie provinces over the same period and remember that our farm land values are only fifty per cent. of those of Kansas and Minnesota. Comparing this record of our prairies with wheat production of other major wheat-growing countries, we find our average in the West is 17.5 bushels per acre, the

United States, 14.1 bushels; India, 11.3 bushels; Argentine, 10.6 bushels; Australia, 10.4 bushels and in Russia, for a period of 15 years, 9.4 bushels per acre.

We find then, that the average rate of production over twenty-five years of the four principal wheat-growing States of the Union is approximately 12.4 bushels per acre, as compared with an average for Western Canada during the same period of 17.5 bushels per acre. This is an astounding difference. Apply the result to the present total acreage under wheat in our West, about 24 million acres, and we arrive at a rate of production, which gives our farmers a clear, annual revenue advantage of over 120 million bushels, worth about 140 million dollars, with less effort and expense involved in farming this area than in the great wheat-producing States south of the line. I particularly want to drive home just what this means. It represents an increase in gross returns to our farmer of almost fifty per cent. over and above average results in the States mentioned for the same period of twenty-five years, which is long enough to establish conclusive comparisons.

If our less favoured competitor south of the line merely pays his way, our farmer would apparently make a handsome profit. And we do it on cheaper land and lower taxation, and pay a much lower average rate of transportation on our wheat. The United States wheat grower must compete with us in the open market of the world as long as he is on an export basis, and, lastly, our wheat is a much superior product and ought to command a substantial premium, which, as a matter of fact, it invariably does.

25-Year Comparison in Yields of Wheat Per Acre between Prairie Provinces and Principal Wheat Producing States of the Union.

PROVINCE OR STATE	1904	1905	1906	1907	1908	1909	1910	1911	1912	1913	1914	1915	1916	1917	1918
Manitoba	16.5	21.1	19.5	14.2	17.3	17.3	13.5	18.3	20.7	20.0	15.5	26.4	11.0	14.9	16.5
Saskatchewan .	17.5	23.0	21.4	13.5	13.6	22.1	15.5	18.5	19.9	19.5	12.4	25.0	16.3	14.3	10.0
Alberta	16.6	21.5	23.1	18.3	18.8	19.0	12.7	20.8	18.2	19.6	15.3	31.0	25.0	18.3	7.7
Average for Yr.	16.9	21.9	21.3	15.3	16.6	19.5	13.9	19.2	19.6	19.7	14.4	27.5	17.4	15.8	11.4
North Dakota	11.8	14.0	13.0	10.0	11.6	13.7	5.0	8.0	18.0	10.5	11.2	18.2	5.5	8.0	13.6
South Dakota	9.0	13.7	13.4	11.2	12.8	14.1	12.8	4.0	14.2	9.0	9.1	17.1	6.8	14.0	19.0
Minnesota	12.8	13.3	10.9	13.0	12.8	16.8	16.0	10.1	15.5	16.2	10.6	17.0	7.6	17.5	18.0
Kansas	12.4	13.9	15.1	11.0	12.6	14.4	14.0	10.7	15.5	13.0	20 5	12.5	12.0	12.2	14.1

Province or State	1919	1920	1921	1922	1923	1924	1925	1926	1927	1928	Average for 25 years	Province or State
Manitoba	14.3	14.0	11.5	19.3	11.3	16.9	17.8	22.6	14.0	19.1	16.9	Manitoba
Saskatchewan .	8.5	11.2	14.9	20.2	19.8	10.2	18.5	16.2	16.4	22.0	16.8	Saskatchewan
Alberta	12.0	20.5	11.3	11.3	28.0	11.0	18.0	18.5	27.4	23.2	18.7	Alberta
Average for Yr.	11.6	15.2	12.6	16.9	19.7	12.7	18.1	19.1	19.3	21.4	17.5	For three Provinces.
North Dakota	6.8	9.1	8.5	14.1	7.4	15.7	11.7	8.0	12.7	13.8	11.2	North Dakota
South Dakota .	8.0	9.0	9.0	13.2	9.6	14.6	11.8	5.7	14.9	10.6	11.5	South Dakota
Minnesota	9.4	9.8	9.7	13.9	12.7	22.1	13.4	12.9	11.9	15.0	13.6	Minnesota
Kansas	13.8	15.4	12.2	12.6	10.1	16.3	9.0	14.8	12.2	17.0	13.5	Kansas
											12.5	For four States.

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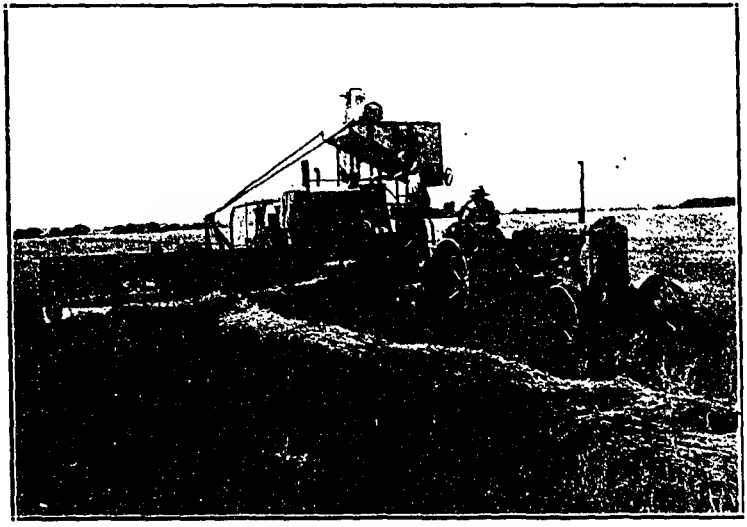
Every business man in Canada should carefully study these crop yield tables. They tell a story that is confidence inspiring. We hear a great deal periodically about the occurrences of crop failures in the West. Of course, seasons vary considerably. But take the trouble to look over the crop statistics. They show there was not a single year in the past quarter of a century when the western crop failed to return an average of over 11 bushels of wheat per acre. That is very far from the generally accepted margin of "failure." Examine the statistics of the four States, and observe how often 5, 6 and 7-bushel crops occurred on their expensive lands, with higher transportation costs, taxes and general operating expenses. An agricultural country of the size of our prairie provinces, with a quarter century production record as shown, is to all practical purposes failure-proof. Individual farmers may fail. Sections of considerable size may have a crop failure. But there have been during the past 25 years no such situation as a general crop failure, as the term is understood elsewhere.

It is true, that in years of comparatively low yield or low prices, agricultural distress often prevails in large sections of the West. This, however, is seldom due to overhead and operating costs exceeding total receipts for the season, which in urban business would constitute a loss on the year's operations. The cause of such distress, in nine cases out of ten, is rather failure to create a sufficiently large amount of new capital to take care of outstanding obligations on capital account. The average western farmer—and this applies to farmers in new countries everywhere—generally starts business on the proverbial

"shoestring." Land, equipment, and often livestock, is purchased on the instalment plan, with the smallest possible cash payment. He faces a double problem. First, to provide a living for himself and family, and, secondly, to create in the shortest possible time a comparatively considerable capital out of net earnings. This task frequently occupies a lifetime of hard work and rigid economy. If he encounters a run of unfavorable seasons at the start, his creditors become impatient, his morale breaks under the strain and he gives up. The result is loss all around.

But the outstanding fact to keep clearly in mind is, that aside from the constitutional ne'er-do-well, failure to provide a modest living on a farm practically never drove a family off fair, average land in a fair, average district in Western Canada. The central farm problem in the West is lack of sufficient capital, not failure to make the farm pay, as the term is understood in general business. Over-expansion, the injudicious use of credit, might be a more appropriate term. We have, however, entered an era, where the minimum of farm equipment, sufficient for all useful purposes twenty-five years ago, leads only to stagnation and a life of perpetual toil during long hours. The ambitious man cannot contemplate such a future for himself and family with equanimity. He makes the plunge sooner or later and in doing so frequently discounts future prospects unduly. With fair luck he works out his financial problem in time, but a couple of sub-normal seasons are apt to encompass his downfall. There is, of course, a distinct limit to the ability of creditors to carry a farmer over a prolonged period of stress, but it is, nevertheless, a fact, that if an honest farmer can contrive to remain in occupation, sooner or later he pays his debts in full.

Demonstrating Caterpillar Tractor and Combine in England.



The Reaper-Thresher with pick-up device lifting and threshing the swathed grain. Rather a slim crop represented here.

We frequently see the spectacle of eastern business concerns being stampeded by press reports on the western crop situation. Adverse local conditions, affecting only a fraction of one per cent. of the whole area, such as occurrences of hail, rust or prolonged drouth, are magnified into wholesale disasters through the misinterpretation of sensational headlines in the daily papers. With widespread cultivation over an area 800 miles long by two hundred miles wide, it is evident that there will be calamitous conditions here and there, even in the best of years. And in the worst of years, on the other hand, there will be large sections with fairly satisfactory crop conditions. It is always difficult to estimate average yields. That sort of forecasting is mere guesswork in dry seasons when the contrast between good and poor farming is so very much accentuated. With the very marked improvement that is taking place each year in farming technique, and with the more extensive mechanization of the farm, and, consequently, ever diminishing production costs, a general condition of agricultural distress at any time is becoming a very remote possibility indeed.

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Predictions of coming greatness necessarily contain an element of uncertainty, no matter how plausible may be the argment. There is, on the other hand, something very satisfying about the actual, proven record of performance. It admits of no argument, and generally furnishes a sound and reliable guide to estimating or verifying forecasts of the future. The prairie provinces may confidently rest their case on the past. It tells a story of successful, agricultural

development within the comparatively brief period of twenty-five years, never approached by any other country in the world.

The nearest contender would be the United States, with its two billion acres of land surface, and one billion acres of farm area, but even that great, agricultural country falls far behind in the comparison. I shall take area under wheat as the index. Our prairie section increased its area under this cereal between the census periods 1901 and 1926 by 19½ million acres. Although the arable area of our three western provinces is no greater than that of three average states of the union, I shall make the comparison with the whole of the United States, Atlantic to Pacific. Between 1875 and 1900 that enormous country increased its wheat area by only 11½ million acres, and between 1901 and 1926 by 18 1-3 million acres. And these two periods witnessed an increase in total population there of 65 million. This comparison is, of course, primarily intended to establish the predominant position wheat production now occupies, and is destined to occupy, in Canada's agricultural future.

It is scarcely necessary to quote statistical proof of the overwhelming importance of wheat production in Canada's present economic life. Wheat and flour represent one-third of her total exports. Without these items we should have an annual, adverse trade balance of a couple of hundred million dollars. The next export item in point of importance is printing paper (117 million dollars) which is less than one-third of our wheat and flour exports. The value of the Canadian dollar is maintained at par through our wheat exports. Wheat represents one-fifth of the annual, total value of all Canadian products.

In the field of transportation, the 15 million tons of wheat produced in a good year looms up largely. If we assume that each ton is moved an average distance of 1,300 miles, we would get a total haul of over 19½ billion tons moved one mile, which is a little more than half the total, annual freight traffic of all our railways in 1926. I do not, of course, aim to convey the impression that our wheat and flour traffic is responsible for half of the freight traffic earnings of our railways. It is, as a matter of fact, carried at a remarkably low rate, which does credit to Canadian railway efficiency. No country in the world can point to land-borne traffic carried at anywhere near a comparable rate basis. This low rate has been consistently maintained against enormously increased railway operating and maintenance costs, and is wholly responsible for the fact that prairie wheat production has become an economic possibility.

As an item in the domestic commerce of Canada, wheat and wheat products occupy a commanding position. They represent in value about ten per cent. of Canada's total purchasing power. Arguments are not needed to emphasize this point. Eastern industrial and business concerns watch with feverish anxiety the course of the prairie wheat crop. They do not need to be told the effect on business of the western crop result of the season. The wheat cheque is regarded as an important element in the life blood of Canada's business.

In conclusion, I would like to direct special attention to this significant fact, that the exports that leave Western Canada are the fundamental necessities of human life, the primary foodstuffs upon which mankind relies. Indeed, far from having to indulge

in a frenzied search for markets, we know that our products are wanted. Western Europe, as time passes, is making an increasingly anxious study of how to assure to its teeming population guarantees of ample supplies of foodstuffs. This situation is the safety factor in prairie farming, and makes a sound foundation for further spectacular agricultural development, such as the future is destined to witness.

A study of the probable future of wheat production, such as I have attempted to present in this volume, involves a consideration of so many factors that the mind of the reader is apt to become confused. Obviously, no one can speak with any degree of certainty on an issue of world-wide interest. But there are nevertheless certain conclusions to be drawn. Secretary Hyde, of the United States Department of Agriculture, recently said:

"There is a challenge for every individual farmer in the year ahead—there is also a great opportunity. We confront in the coming years as stern a test as ever faced our forefathers. Our forefathers unwittingly created the challenge. They put a continent under the plow in the span of a century. Modern farmers have harnessed power and science to the plow. The result of the energy of the pioneers plus our own producing efficiency is an agricultural industry easily capable of producing stifling surpluses of crops and animals. Blind production for an unknown demand is now the bane of agriculture. Competitive selling by 6,000,000 individual farmers usually gives the purchaser a great advantage. The challenge of the new decade is to act collectively to overcome this situation. To succeed we shall need all the hardihood of our ancestors. We shall need all that science, invention, and leadership can afford to us."

"The total area under cultivated crops in Canada, Argentina and Australia, has increased 200 per cent. since 1900. These three countries had over 40 million more acres sown to wheat in 1929 than in 1900, a gain of over 300 per cent. Their combined wheat acreage is now greater than that of the United States, while in 1900 it was only one-third as much. The area under corn in Argentina is four times what it was in 1900. That country is now the world's largest exporter of corn."

There can be no doubt that the spectre of agricultural over-production is haunting the farmer the world over. But agriculture does not stand alone in this respect. A recent review by the Royal Bank of Canada says:

"World production of wheat, lumber, newsprint, coffee, sugar, cocoa, rubber, wool, and many other commodities, has exceeded consumption. The available capacity and equipment for the production of iron and steel, automobiles, textiles, and many other manufactured products is substantially in excess of that warranted by volume of demand. If one considers a single commodity such as sugar, or the position of a single industry such as automobile manufacture, the situation within that particular industry may seem self-explanatory. It may be true that there is a greater production of lumber or coffee than the world can use, but when it is found that substantially the same facts are simultaneously true concerning commodities as diverse as copper, wheat and textiles, and the others mentioned above, the assumption seems justified that world buying power is not being maintained at a satisfactory level. Although over-expansion in a single industry is a matter for correction within the industry, when overproduction becomes general in many lines, that fact constitutes prima facie evidence that it is the price structure which in turn is governed by the monetary situation, that is at fault. When most of the countries of North and South America and Europe find that a large proportion of their major industries are on the verge of depression, there is no hope in the dictum that workers must seek employment in less congested industries and that the surplus plants must be adapted to new uses. There are no industries in a position to receive such an overflow."

As I see the situation, there is little hope of any increase in the prevailing, basic price of wheat for years to come. On the other hand, there is every evidence of a period of falling general commodity prices ahead of us. If the basic price of wheat declines at all, which is doubtful, the rate of decline will be comparatively imperceptible. The final result should be a higher purchasing power per bushel, which would be equivalent to an increased monetary value, and would remove the main handicap under which the grower has been labouring for many years.